The Canadian
Medical Association Journal

Vol. XIV TORONTO, AUGUST, 1924 No. 8

An Address

ON CLINICAL AND LABORATORY METHODS OF DIAGNOSIS*

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IT might very properly be asked what is the object of the process we call medical education? The natural answer is: To train men we call doctors. What for? To care for the health of the people. All the people? Yes. Not the fifteen or twenty per cent of difficult cases only, but all the people including the whole family; confinement, measles, colds, ear-ache, teething, broken arm, pimples, hives, and spinal cord tumour. This brings up the point of what type of training the men should have. Another way of putting it would be to say that a fair proportion of doctors should be general practitioners. And what is a general practitioner? He is a man to whom the family looks for all their medical advice. He takes care of eighty per cent of their illnesses and refers the other twenty per cent to the specialist. And what is the specialist? He is a man who has spent extra time and extra money trying to better fit himself to care for certain limited types of cases. He, of necessity, sees fewer cases than the general practitioner and goes into each case more thoroughly than the general practitioner has time to do. To be a specialist does not at all consist in assuming that title merely to be able to extract a larger fee from the innocent sufferer.

Now what is the point of this introduction? What should be the training of the two groups of men? To put it another way: of all that these two groups of men can and do learn what part is most valuable to each? What are the attainments of each, educationally, when they start out into the world? Frankly, are the attainments chiefly those learned in the laboratory or are they chiefly those learned at the bedside? And should there be a different type of training for the two groups in the undergraduate school? One cannot agree at all with the statement of Rutherford Morrison where he said to the Canadian Medical Association in 1914: "The teaching of those students who are to become practitioners should be different in character and more limited in aim than that intended for developing surgeons." In my opinion there should be but a very small number of medical students allowed to graduate who do not follow a course primarily intended to train what Rutherford Morrison with a slight tinge of sarcasm calls "practitioners." The specialist, be he surgeon or what not, should have a general training like that of the general practitioner.

Therefore let us consider the necessary attainments of the man doing general practice. What qualities should he possess and what further superstructure must be built on these inherent qualities? He should possess at least sympathy, patience, perseverance, discrimination, and judgment. Sympathy—feeling in company with another. In the practice of medicine there are perpetual occurrences which are apt to harass the temper, unless one regards them with patience. There is real virtue in perseverance, for with it what might seem at first impracticable is accomplished. Without it the best intentions would remain unfulfilled and the best plans would be defeated. Discrimination is very necessary in order to select from all the facts, gleaned from the various sources, those that are relevant to the illness for which he seeks advice. Judgment requires actual knowledge and actual experience; it dis-

*Read before the Winnipeg Medical Association. April 18th., 1924.

cerns or perceives what is probably right; it determines on the choice of what must be considered when the mind finally comes to make a diagnosis.

The medical student is always anxious to find something that seems to be exact. The laboratory has this appearance. Therefore it appeals to him. Here is a real danger for, if the student once gets the idea that he must have exactness, that clinical methods are not exact and that laboratory methods are exact, then he gradually slips into the fatal habit of assuming that he can make a diagnosis by the laboratory route alone. In few cases is a laboratory report alone a diagnosis. The example so graphically cited by Harvey Cushing[1] illustrates this very beautifully.

Because of the appeal that the laboratory makes, the student misses that urge that a good clinician has to get the full story of the patient. There is a real lure about the laboratory. Every one knows it is scientific. And there is even a tendency on the part of some scientists to hint broadly that there is nothing scientific about the clinical aspect of medicine. This then all makes a strong appeal to the budding physician.

There is the further added advantage for the laboratory, viz., that of seclusion, and separation from the annoying presence of the patient. In the laboratory the worker sits on his throne, the high stool, garbed in his royal robe, the long white coat. All undisturbed by the smell of the garlic on the patient's clothes, the worker tests the body fluids, or examines pieces of his body under the microscope with that tranquil and detached and almost non-human air which so well marks the mien of the advanced laboratory man. Laboratory methods tend to make one forget the patient altogether in the nicety of the scientific. To stress the point still further, the elaborateness of the equipment, of say, a modern biochemical laboratory catches the imagination of the student. The accuracy of the findings impresses him. The comfort of mind of the seclusion, and the separation from the presence of the unlikableness of the personality of the patient is no small factor and so the pure scientist is happy in the thought of the ease with which the diagnosis may be made in the laboratory with the patient left in the ante-room.

Nor is this all. The laboratory may possibly make mistakes. When the Wassermann reaction was first announced, the problem of diagnosis in syphilis was thought to be solved. The close clinical observation formerly so important was, by some placed in the discard. When the bright thought came of testing one laboratory against another, or of testing a given laboratory against itself by the simple method of sending specimens of blood from one patient under different names, the fallibility of the laboratory was discovered. And this is not all. The very campaign, by the Boards of Health, which educated the people as to the dangers of syphilis, was capitalized by the near-specialist. The simple method of working on the anxiety of the patient, who had a positive Wassermann, and the heart-rending fear of discovery by the relatives, all tended to convert the laboratory into a handmaid to fill the till of the syphilographer. I fear that, in the field of syphilis, the laboratory has assisted in making it possible to commercialize and prostitute the treatment of this disease by some men.

And another charge may be laid against an undue emphasis of the laboratory. The sharpening of the keen edge of the five God-given senses is not over-much encouraged by the elevation to first place of laboratory methods of diagnosis. In the case of a man from the Grain Exchange with loss of appetite the important fact is, not the gastric analysis, but the fall in the price of wheat. And any great calamity or sorrow in the life of any man, even that of a laboratory man, will produce a marked effect on appetite and digestion, an effect, be it said, that cannot be measured by any test-tube method known. It is probably safe to say that the modern development of the numerous cults is to a certain extent caused by the possibly too great leaning on the physical sciences as a complete explanation of and solution for all human ailments.

Regarding laboratory methods, it is quite certain that there is no tendency toward centralization. No man can, or will, attempt to become proficient in all of them. Thus of necessity the patient must be regarded as an aggregation of several or many functions which can be studied separately. Can the patient be conveniently divided up into several units for study? To a certain extent this can be done but still the patient is one and if, at first, studied as many, must be again unified by one master mind, the internist or perhaps in the future by the general practitioner.

The psychiatrist must see innumerable cases in which an error in the workings of the mind produces some direct defect in the functioning of the normal physiological functions of the body. Such cases must primarily be studied from the stand-

point of the mind, toward which little assistance can be looked for from the laboratory.

To a certain extent it may be justly claimed that the overwhelming need for laboratory methods arises because of the lack of excellent ability to observe, record and evaluate symptoms. The estimation of the rate of metabolism is of very great importance in arriving at a correct estimation of the present actual state of health of the exophthalmic case. But who would advocate the taking of the metabolic rate in all the teen-aged girls showing enlargement of the thyroid gland? It requires only a limited amount of clinical acumen to decide that the patient has not got exophthalmic goitre. The use of the formidable machine on each and every patient would in the first place be a waste of time on the part of the physician, but would also be a great waste of money on the part of the patient. In some cases it might tend toward the development of neurasthenia on her part.

The recent innovation of placing final year students in hospital is a tacit admission that, in the past, the student has had too little contact with the patient. Here he learns observation. Equally important, also, he learns a good deal about the reaction of patients to treatment. This is important and cannot be learned anywhere except at the bedside. Here he learns something also about prognosis. Can this be learned in the laboratory? No. Of what importance is prognosis? Just because the patient is human and the friends are human. A frequent serious error in prognosis may easily damn the career of an otherwise good man.

At the present time a good deal is being rightly said about research work. In the minds of all when this magic word "research" is spoken there arises at once that other word "laboratory." Let it be respectfully pointed out that there can be, and is, such a thing as clinical research, and all that is needed is patients. Such are at hand for all men doing practice, even the general practitioner in the country. Thus no man is so situated that material is not at hand unless it be the poor chap shut up in a laboratory. The story of the solution of the problems of malaria and yellow fever are quite as spectacular as any of the wonderful discoveries made in the laboratories, and they were both solved largely by clinical procedure. Aside, briefly, it almost seems as though we are over zealous these days about research. Let us not fall down and worship the Golden Calf too much. Let us keep our feet on the ground.

Finally the evidence is all in. The history of the patient and facts of heredity and environment are recorded. The physical examination is reported on by the eye man and the ear man, by the chest man and the surgeon, by the gynaecologist and the orthopedist, by the urologist, the proctologist, the psychiatrist and the dermatologist. Reports are in from the x-ray, the pathologist, the biochemist, the bacteriologist and the metabolist. The diagnosis is not yet certain. The relative importance of the various facts must be taken into consideration and the process of making a diagnosis consists in this very process of weighing one fact against another as they bear on the illness complained of by the patient. No isolated fact in itself is a diagnosis—therefore the final solution of the problem must lie with a clinician who has broad experience in applying the facts to the case in hand.

Please do not mistake the purpose of this paper. It is not to belittle the value of the laboratory. It is merely to try to get a clear perspective of the relative place of the laboratory and the clinical side of medicine. The laboratory is of inestimable assistance in making a diagnosis in some cases. He would be a rash clinician who would, in this day of enlightenment, refuse to avail himself of the assistance of the laboratory. But many cases can be determined quite without this aid. The great danger is that the rising generation of physicians will cease to try to acquire the full development possible for all the human senses. The laboratory must forever remain an assistant to the clinician, not the clinician an assistant to the laboratory.

REFERENCE

(1) *Jour. Am. Med. Assoc.*, March 15, 1924, p. 841.

The Rockefeller Foundation is supplying Germany with six copies each of four hundred British and American medical periodicals. Two copies will be kept in the libraries of Berlin and Munich, while the other four will be circulated throughout the various German universities, which will be divided for this purpose into four groups.

TUBERCULOSIS OF THE LARYNX—ITS DIAGNOSIS AND TREATMENT

A Plea for Closer Co-operation Between the Physician and Laryngologist*

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A patient comes direct or is referred to the laryngologist for examination. He states he has been feeling seedy for a few months and has lately developed slight hoarseness or aphonia. Laryngological examination reveals incipient tuberculous laryngitis, and subsequent examination of the chest shows an active pulmonary lesion. The patient is advised to leave the dusty, smoky, atmosphere of the city and "take the cure". Some time later he returns to the city as a terminal case to die among the familiar surroundings of his home. The laryngologist is again called in to suggest means of alleviating his sufferings. On examination of his throat one sees large masses of pale granulations and wide ulceration of all the laryngeal structures. The epiglottis is reddened, swollen, ulcerated, and studded with hundreds of tubercles. The whole throat is filled with a copious amount of purulent secretion. Every breath causes the patient manifest pain and distress. No food can be swallowed without producing the most intense agony. No more pitiful, distressing, and heart-rending picture is met with in the practice of medicine. On asking the patient what treatment he has received for his throat the answer given the writer on more than one occasion, I regret to say, has been "no treatment except a laryngeal spray." Such an experience leads one to focus attention and endeavour to promote discussion on the appropriate treatment of tuberculosis of the larynx.

In 1881 Krishaber made the statement that laryngeal tuberculosis was incurable, and this pessimistic view would appear to be shared by some at the present time. Professor Friedrich of Kiel in 1919 expressed what appears to be the general belief among physicians that advanced laryngeal tuberculosis may be improved by local treatment but the cure of the condition depends wholly on the progress of the pulmonary lesion. While it is accepted that the progress of the laryngeal involvement depends to a large extent on the course of the pulmonary lesion, the writer on many occasions, by treatment directed towards the larynx itself, has been able to arrest, and in some cases entirely cure, not only incipient but moderately advanced laryngeal tuberculosis, while the pulmonary condition slowly progressed.

I am aware there are some laryngologists, who through lack of faith or patience, and with relatively little experience with these cases, readily condemn all methods of treatment except the hygienic, but my experience has been also that of many other laryngologists who have carried out active and vigorous local treatment. Freudenthal has repeatedly reminded us that laryngeal tuberculosis is curable in any stage. G. B. Wood, Robert Levy, and other laryngologists whose experience covers many hundreds of cases of laryngeal tuberculosis have directed particular attention to the necessity of active local, in addition to general hygienic, and dietetic, treatment.

Does primary tuberculosis of the larynx ever occur, or is it always secondary to tuberculosis in some other part of the body? Several cases of primary tuberculosis of the larynx have been reported but the writer has never seen a case which was definitely tuberculous and in which a careful examination of the chest assisted by radiograms did not reveal the presence of an active pulmonary lesion. It is generally believed that laryngeal tuberculosis is always secondary.

Frequency.—Tuberculosis of the larynx occurs very rarely in children under ten years of age. That tuberculous laryngitis is of more frequent occurrence in adults than casual observation would lead us to suppose is borne out by the careful investigation of large numbers of tuberculous patients. St. Clair-Thomson[1] reported 72% of third stage pulmonary tuberculous cases with laryngeal involvement. A careful examination of 693 sanatorium cases of all types revealed

*Read at the Tuberculosis Conference, Ottawa, April 9th, 1924.

25.6% suffering from tuberculous lesions of the larynx. Dworetzsky[2] reports a similar percentage in the examination of 600 cases at the New York Municipal Sanatorium. Fetterolf[3] in a hundred cases dying of pulmonary tuberculosis found gross tuberculous lesions of the larynx in 83 cases. Amongst 2347 cases of pulmonary tuberculosis observed over a period of one year by Gregg[4] at the Ohio State Sanatorium, 10% of incipient cases, 21% of moderately advanced cases, and 42% of advanced cases, had also laryngeal involvement. Lockard[5] from the collection of 14 reports gathered from different parts of the world estimates the average at 34.5% occurring three times as often in males as females. Of 101 cases of pulmonary tuberculosis recently examined by the writer at the Mountain Sanatorium, Hamilton, 51 showed an abnormal condition of the larynx, 9 cases showed marked congestion, 7 cases marked pallor, 14 cases had definite roughening and infiltration of the mucous membrane in the interarytenoid space, and 9 cases had well marked circumscribed swollen areas. There was advanced tuberculous involvement with tumescence and beginning ulceration in 5 cases, and far advanced with marked ulceration in 2 cases.

Symptoms.—That well marked tuberculous involvement of the larynx may occur and give rise to very little or no symptoms is a fact that should not be overlooked and may account for the discrepancy in the number of cases usually reported. It is well known that many of these cases especially those of the chronic infiltrating type may remain quiescent for long periods and heal spontaneously when the patient's pulmonary lesion is arrested. However, early recognition of a primary lesion in the larynx or a secondary complication is most desirable and essential to a favourable termination.

The usual symptoms of recurring or persistent hoarseness or aphonia, dryness and a burning sensation in the throat, are present when the tuberculous involvement is extensive enough to interfere with the function of the true cords. It has been observed that well marked involvement of the base of the epiglottis, ary-epiglottidean folds, and the upper portion of the interarytenoid space, may occur without producing any particular symptoms apart from a so-called "throaty" voice. The patient may not complain and the physician's attention may not be directed to the larynx, with the result that unless a careful laryngological examination be made the disease may progress considerably before it is recognized. On the other hand, aphonia or huskiness occurring in the course of pulmonary disease may not always indicate tuberculous involvement of the larynx. As pointed out by Mays[6] and Cornet,[7] the pressure of tuberculous bronchial glands on the recurrent laryngeal nerve may produce the paresis of one vocal cord with resulting hoarseness. In advanced laryngeal cases, dysphagia is a most constant symptom, more particularly noted where there is ulceration and necrosis of the epiglottis. Where extensive granulomata or tuberculomata are present one may find a degree of stenosis with stridor.

Clinical signs.—The typical turban-shaped swollen epiglottis, the pale pear-shaped tumescent arytenoid, the thickened infiltrated condition of the mucous membrane particularly in the interarytenoid space or so called vocal angle, are signs familiar to all chest specialists. The irregular superficial ulcerations covered by a thin purulent secretion which on removal reveals pale granulations or pinpoint white tubercles are seen in the more advanced stages. A characteristic of tuberculous laryngeal involvement as distinguished from other forms of laryngitis is the asymmetrical disposition of the lesion. A small circumscribed swollen area limited to one arytenoid or ventricular band and occurring in the course of a pulmonary tuberculosis, is considered by Schroeder[8] almost pathognomonic of beginning tuberculous involvement and when it is observed, it should always be looked upon with suspicion and prophylatic measures instituted. All tuberculous patients showing congestion or anaemia of the larynx should have frequent laryngological examinations. As long as the surface of the larynx is intact a more hopeful prognosis may be looked for, but once ulceration occurs the portals are open wide for secondary infection.

In the differential diagnosis syphilis must always be taken into consideration, and the fact that we may have a combined affection should be borne in mind. The writer has had several cases presenting a typical clinical picture of laryngeal tuberculosis and giving a negative history of syphilis but in whom the Wassermann test of the blood is reported strongly positive. That cases of advanced tuberculosis giving a negative history and presenting no clinical signs of syphilis may give a positive Wassermann test was pointed out by Downs[9] in 1922. Unless the clinical picture of the larynx is suggestive of a combined affection we are not justified in instituting anti-syphilitic treatment solely on a

report of a positive Wassermann. In a personal communication recently received from Dr. Robert Levy of Colorado, the latter states that "In cases of combined affections, if the preponderance of affection is luetic patients respond promptly to anti-syphilitic treatment. If, on the other hand, greater influence is due to tuberculosis any anti-syphilitic treatment is of little avail and at times is injurious."

Treatment.—There is no specific remedy for tuberculous laryngitis. In 1910, Sir Felix Semon[10] emphasized complete vocal rest, and it is now generally recognized that this is the most essential part of treatment. Is it possible to carry this out in actual practice? All writers on this subject mention the difficulty in getting patients to refrain from using their voice. In this respect may I offer a suggestion. When we wish to place an arm or leg at rest we do not depend entirely upon the patient but assist him by placing the affected member in a splint or plaster cast. As the larynx does not lend itself to this method may we not assist the patient by other means. At the Christie Street Hospital we have endeavoured to do this by placing all cases of laryngeal tuberculosis in one ward. For a patient to remain silent while surrounded by others who are talking and laughing requires the utmost exercise of the will. If the patients about him are also silent his task is very much lightened. Visitors should be asked to co-operate with the physician and patient in refusing to allow the latter to talk. Writing pads should be supplied and renewed as often as necessary. In addition to this, the placing of placards with the words "Do not talk" or some similar phrase on the walls of the ward are a constant reminder to the patient of the necessity of carrying out this regime.

Treatment of associated naso-pharyngeal disease.—That every tuberculous patient should be able to breathe freely through the nose in order that the air reaching the lung is properly warmed, filtered, and moistened, was particularly emphasized by Watson-Williams and Dundas-Grant[11] at the meeting of the British Medical Association in 1911. This is of paramount importance in laryngeal tuberculosis. Marked nasal obstruction invariably leads to improper nasal ventilation with its sequelæ—chronic hypertrophic rhinitis, nasal polypi, purulent sinusitis, particularly of the maxillary antrum, catarrhal pharyngitis, and laryngitis. In chronic bronchitis and other non-tuberculous chest affections these conditions are so frequently found as to warrant one considering obstruction as a definite etiological factor in the production of these diseases.

In laryngeal and pulmonary tuberculosis on the other hand I have found it rather the exception than the rule to observe any marked pathological condition in the upper respiratory tract necessitating operative treatment. Focal infection in the tonsils and rhinitis sicca are perhaps most frequently found. Most patients state they find the use of a laryngeal and nasal spray containing menthol, camphor, and oil of eucalyptus, of considerable benefit in relieving the slight catarrhal condition of the nose and throat which is usually present and softening and permitting the easy removal of thick tenacious sputum from the larynx. Where, however, operation is considered necessary the presence of an active tuberculous lesion in the lung is not a contra-indication. I have never found it necessary to use general anæsthesia and the tuberculous patient appears to be less susceptible to the shock of a nasal or throat operation under local anæsthesia than many other cases. In some types of patients it is not uncommon to get very marked toxic effects and even death following the injection of local anæsthesia. I have never observed the slightest toxic effect following the use of local anæsthesia in uncomplicated cases of laryngeal or pulmonary tuberculosis.

Local laryngeal treatment.—Direct treatment of the larynx itself may be divided into medicinal and surgical measures. For many years the application of varying strengths of lactic acid as recommended by Krause have been used by many physicians with varying results. Major recommended submucous injection of lactic acid, and Heryng iodoform emulsion. Dworetzsky[12] has reported a number of cures from the application of iodine and potassium iodide in increasing strengths. Various other drugs, including argyrol, formalin, and silver nitrate, have been used extensively in the treatment of this disease. Oil of chaulmoogra, which has given such marvellous results in leprosy, has lately been added to the list. Kolmer and Jager[13] report that chaulmoogra oil has no appreciable germicidal effect *in vitro* on a strain of bovine tubercle bacillus. Alloway and Levenson[14] have reported results in 40 patients who received a daily application of a 20% solution of chaulmoogra oil in liquid paraffin. They state that it was useful in the majority of cases, and, although it may be true it has no specific effect on the tubercle bacillus itself, its beneficial action may be ex-

plained by its detergent, anæsthetic, and counter-irritant properties. The fact that so many different drugs have been tried would indicate that medicinal treatment while palliative cannot be considered as a curative means in laryngeal tuberculosis. It is perhaps because of the repeated failure to obtain results by applications of these various drugs that so many physicians have become discouraged and have given up attempting to cure by local treatment.

Heliotherapy.—Since the days of the ancient Egyptians belief in the curative power of the sun has been universal. In 1903 Rollier began treating his tuberculous patients by exposure to sunlight and his success at Leysin led to the opening of many other clinics conducted on similar lines. Finsen's success with the Alpine arc light in the treatment of lupus was followed by the experiments of Cooper-Hewitt and Kromayer with a mercury quartz lamp which emitted actinic rays. To-day the treatment of all forms of tuberculosis by sunlight and artificial light is being carried on very extensively all over the world.

Edgar Mayer[15] in a recent critical review gives us the results obtained by numerous therapeutists using this form of treatment. Opinions may differ as to the value of the heat rays but it has been definitely proven that the ultra-violet or actinic ray has a direct germicidal and chemical effect and is capable of destroying the tubercle bacillus. The radiation of the whole surface of the body with the Alpine lamp produces an increase of the calcium and phosphorus content of the blood as well as of the hæmoglobin of the red blood corpuscles. The beneficial effect in surgical tuberculosis is now well established.

Regarding pulmonary and laryngeal involvement one can only state that it is still in the experimental stage. The writer has had no experience with heliotherapy in the treatment of laryngeal tuberculosis. From a perusal of the literature on this subject and from personal communications received from a number of sanatoria it would appear that radiation of the larynx is giving very encouraging results. Natural sunlight is preferable to artificial light. The metallic condensing mirror made of magnalium—a combination of magnesium and aluminum—which absorbs the heat rays and reflects only the actinic is the one giving best results[17]. Unfortunately in most parts of Canada we have relatively so little sunlight that treatment by this means is possible only during a few months of the year. Fortunately there has lately been devised a laryngeal attachment to the Kromayer water cooled lamp made of quartz with a magnalium reflector. This can be inserted into the lower portion of the pharynx and the maximum effect of the actinic ray obtained. Mayer says that "theoretically one might justifiably expect that ultra-violet radiation of sufficient intensity to produce focal reactions can stimulate healing of tuberculous laryngitis." His impressions from this form of treatment by direct application of the rays are encouraging. X-ray treatment has so often led to disastrous complications that its use is not recommended. Fulguration has been successfully used by Freudenthal[16] but the difficulty in controlling the depth of penetration is a very serious objection to its use in laryngeal conditions.

Surgical treatment.—Under the heading of surgical treatment one includes the curetting of ulcerative areas and granulating surfaces as recommended by Heryng to promote vascularization, and the removal of the epiglottis for dysphagia, and odynphagia due to extensive ulceration of this portion. The latter gives immediate relief and is a procedure that can be recommended where indicated. In advanced cases of pulmonary tuberculosis in which there is extensive ulceration of the whole larynx causing extreme pain, relief is given by applications of orthoform emulsion or anæsthesin and injection of the internal laryngeal nerve. Hoffman[18] recommended the use of 85% ethyl alcohol for the latter purpose. If one adds to this 1% novocaine the pain of the actual injection is very much lessened and the resulting anæsthesia is more lasting. Resection of the internal laryngeal nerve has been done for relief of pain but such a procedure appears to me as somewhat radical for these advanced cases.

Use of galvano-cautery.—Like other laryngologists who have had occasion to treat laryngeal tuberculosis I have been so discouraged by the difficulties encountered in accurately applying lactic acid and other drugs and the repeated failure to observe any marked beneficial results that I have gradually given up topical applications. Lately, I have had such excellent and uniform results from the application of the galvano-cautery that it has practically replaced all other forms of medical and surgical treatment. In a series of experiments on guinea pigs, Wood[19] found that cauterization of a tuberculous area is followed by an inflammatory reaction, the formation of granulation tissue attended by the presence

of fibroblasts. New blood vessels are formed and within twenty days time the tubercles are replaced by a fibrous cicatrix. The object of cauterization is not the destruction of tuberculous tissue but the formation of an eschar with its attending vascularization of the part. As stated by Wood "bloody surgery of the tuberculous larynx though frequently accompanied by very favorable results has reached the end of its usefulness for the sole reason that the electric cautery will accomplish the same results with none of its disadvantages." It is undoubtedly the method *par excellence* for the treatment of laryngeal tuberculosis.

Technique.—In the hands of one with experience in the manipulation of instruments within the larynx the application of the galvano-cautery is a perfectly safe and sound measure. Suspension laryngoscopy and direct laryngoscopy are unnecessary. My custom has been to thoroughly anæsthetize the pharynx and larynx by an application of a 20% solution of cocaine. An assistant holds the patient's tongue. The patient is asked to relax and breathe quietly and regularly through the mouth. With the aid of a large laryngoscopic mirror the cautery is accurately placed on the portion of the larynx one wishes to cauterize. The current is then turned on and a puncture varying from a sixteenth to a quarter of an inch is made in the swollen tissue. Two or three punctures in different areas may be made at one sitting. In order to avoid the possibility of post-operative œdema only one side of the larynx is cauterized at one sitting. After a period of a week or ten days the other side is similarly treated. Cauterization causes the patient no distress and no complications have arisen in any of the cases I have treated. The cauterization of an ulcer results in the destruction of the neuromata which are so often the source of pain in these cases. Relief is immediately given. The healing of a tuberculous ulcer after cauterization is so rapid as to be comparable to that observed in syphilitic ulcers of the throat following an injection of salvarsan. Large tumescent arytenoids rapidly diminish in size and after a few weeks' treatment the laryngeal structures begin to present a normal appearance.

That such treatment is successful in arresting the progress of laryngeal disease even though the pulmonary lesion progresses is illustrated by a case at present in the Mountain Sanatorium at Hamilton. A patient who had moderately advanced tuberculosis of the larynx and who had been hoarse at intervals for a year received eight treatments with the galvano-cautery within a period of four months beginning in July 1923. At the end of two months' treatment the patient's voice was normal and at the end of four months his laryngeal involvement appeared to be arrested. He was transferred to the Mountain Sanatorium where I again examined him a few days ago. He stated he had had no further trouble with his throat. Laryngological examination showed slight thickening of the mucous membrane but the larynx otherwise presented a normal appearance. I was informed by his physician that he has far advanced pulmonary tuberculosis which appears to be slowly progressing. Similar results have been observed by me in many other cases. I have been so impressed with the favourable results obtained that I am convinced that provided the patient's general vitality and nutrition are fairly good 75% of cases of laryngeal tuberculosis in the incipient or moderately advanced stage can be completely arrested and 90% can be materially improved by the employment of the cautery in local treatment.

I can fully endorse the opinion expressed by Wood[19] that "any Sanatorium not equipped both in its personnel and in its instrumentarium for the cauterization of tuberculous lesions of the upper respiratory tract is not giving its tuberculous patients the utmost of modern medicine, and the laryngologist who fails to avail himself of its advantages is not a proper person to treat this disease." Any laryngologist who would attempt to treat laryngeal tuberculosis by local measures and entirely neglect hygienic and dietetic treatment would be considered unfit to practice his speciality. *Vice versa*, any lung specialist who neglects to avail himself of the services of a laryngologist in the treatment of this disease may be placed in the same category.

Summary

1.—Early recognition of tuberculous involvement of the larynx is most desirable and regular laryngological examinations should be made of all patients suffering from pulmonary tuberculosis.

2.—The policy of "laisser faire" should be replaced by active local treatment.

3.—A large percentage of cases of laryngeal tuberculosis may be completely arrested by the employment of the following measures: (1) Hygienic and dietetic treatment. (2) Absolute vocal rest. (3) Appropriate treatment of any associated pathological condition in the upper respira-

tory tract. (4) Heliotherapy. (5) Application of the galvano-cautery to the affected areas in the larynx.

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ROENTGEN-RAY SICKNESS AND CHLORIDE RETENTION*

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SCHMITZ[1] has recently given an elaborate summary of the possible causes of Roentgen ray sickness, from which it would appear that up to the present time there has been no theory which will satisfactorily account for this condition. During the past six months we have made a number of observations of which a brief account is now given.

Lange[2], in 1915, suggested that the condition might be associated with an acidosis developed as a result of cellular destruction. Case[3] could obtain no positive tests for acidosis.

We have made observations on three patients and could find no evidence of acetonuria, nor of a lowered pH value of the urine as a result of treatment, nor of any definite increase in lactic acid excretion; an acidosis appears to be excluded.

Cori and Pucher[4], in September last, published results showing marked chloride retention in three patients as a result of X-ray treatment. Their figures appear to show that the one patient who developed typical sickness showed the most marked chloride retention. Dodds and Webster[5] claim on the other hand to have observed a transient increased chloride excretion as a result of X-ray therapy. They attribute the cases of sickness in their series to psychical causes.

Schlagentweit and Sielmann[6], in 1922, stated that radiation treatment causes rapid lowering of the blood chlorides, and that X-ray sickness can be cured rapidly by administration of sodium chloride intravenously or by mouth. We have been able to consult an abstract of their paper only; their results, as we shall show later, agree with those of Cori and Pucher, and do not disagree with them, as Schmitz appears to conclude.

Our own observations have been directed chiefly to test the accuracy of Cori and Pucher's results concerning chloride retention, and to see whether the sickness could be alleviated or prevented by administration of sodium chloride. While we cannot yet regard our experimental data as conclusive, they would appear sufficiently definite to suggest that further work of this nature is desirable.

We deduce the following tentative conclusions:

(1) Roentgen-ray therapy in massive doses produces a definite lowering of urine excretion, and a definite chloride retention when the epigastrium is rayed. Radiation of other parts of the body produces less effect.

(2) With epigastric radiation, where the previous chloride excretion is low, the tendency to sickness, other things being equal, is greater.

(3) Preliminary feeding with sodium chloride daily, so that the chloride excretion is raised to ten or more grams per day before treatment is commenced, with continued feeding during treatment, prevents or lessens the sickness.

*Abstract of paper read before the Winnipeg Medical Society, May 16th., 1924. Received for publication, June 16th., 1924.

(4) The blood chlorides are not invariably affected, though sometimes there is a lowering.

These conclusions are supported by the following (abbreviated) case reports:

Case 1.—C. L., male, aged 58, had a mass in the upper right abdomen. Exploratory laparotomy showed carcinoma of the first part of the transverse colon, the mass extending upwards in the region of the bladder, with marked glandular involvement. It was considered inoperable. X-ray treatment was confined to the right side of the abdomen. Two 13 cm. ports of entry were used, one anterior, and one posterior; 150 k.v. with filters consisting of 0.75 mm. copper and 1 mm. aluminium were used on the anterior port, and 200 k.v. with 1 mm. each copper and aluminium on the posterior port. In all, 16 m.a. hours were given by the fractional method, in six treatments spread over eight days.

The urine volume on the day previous to treatment was 1,190 c.c., on the first day of treatment 1,090, the average during the next seven days 750, and on the day after treatment ceased 1,120 c.c. The corresponding figures for the sodium chloride in the urine were 8.90, 9.30, 5.24, and 7.90 grams. The patient was not sick and ate well throughout the treatment. The results show a definite chloride retention, but the lowest excretion-figure (penultimate day of treatment) was still 3.82 grams.

Case 2.—Mrs. A. M., aged 40, with carcinoma of cervix. She had had treatment six months previously with radium. Deep X-ray therapy was advised to the whole pelvis. Her general condition was good. The "cross fire" method of fractional dosage was employed using two 10 cm. ports anteriorly, and one 13 cm. port posteriorly. The factors used were 200 k.v., a filter of 1 mm. each copper and aluminium; target skin distance 50 cm. In all, 18 m.a. hours were given, divided into six daily treatments spread over eight days. The average urine volume in cubic centimetres and sodium chloride in grams for the two days preceding treatment, the first four, and the subsequent three days of treatment, were respectively 936, 792, and 1,053, and 4.11, 3.69 and 5.66. She ate well throughout the treatment and was not sick. At most there was a slight transient lowering of urine volume and NaCl excretion. The effect was less than in cases 1, 3, and 4; the epigastrium was not rayed.

Case 3.—F. M., aged 69. Carcinoma of the stomach. Five daily treatments were given, with the factors 100 k.v., and target skin distance 25 cm. Previous to treatment he was eating very little. His urine volume for the two days prior to treatment averaged 382 c.c., and the NaCl output 1.14 grams. During treatment the average figures for the five days were 404 c.c. and 0.12 grams. The day following cessation of treatment the figures were 335 and 0.26. He was nauseated throughout the treatment and ate very little, which of course accounts in part for the drop in NaCl excretion. We associate the production of sickness with the low preliminary chloride excretion.

Case 4.—H. P., aged 57, had a mass in the epigastrium, and X-ray examination with a barium meal showed a large gastric filling defect, involving the lower two-thirds of the antrum of the stomach, and suggesting an extensive new growth, with possible involvement of the liver. He was given at first nine daily treatments, spread over ten days, using nine 10 cm. anterior ports and four 10 cm. posterior ports, in all 32.5 m.a. hours, the factors being 100 k.v., 30 cm. focal distance, and 4 mm. aluminium filter. X-ray treatment produced an immediate decrease in urine volume and chloride excretion. There was vomiting on the second day of treatment, and thereafter for eight days the patient was nauseated and ate poorly. During this period there was a slight increase in urine volume, but the chlorides remained low. Nitrogen excretion was fairly high. At the close of the first period of X-ray dosage he ate moderately well, but the chlorides stayed low. Five days later, on account of the destruction of the formed elements of the blood, quartz lamp treatment was given (on alternate days, commencing three minutes back and front, and increasing by three minutes per treatment to eighteen minutes). There was an immediate beneficial effect on the blood. The patient ate better. But the chloride excretion dropped to a still lower figure, and was not much increased by giving daily five, and then six grams of sodium chloride by mouth. (We cannot explain this effect. We have tested lamp treatment alone on two other patients, and have found no effect on chloride metabolism). A subsequent period of X-ray treatment with the extra NaCl dose continued *was not marked by any degree of sickness*, but was accompanied by a further diminution of chloride excretion. The chemical findings are summarized in the following table:

TABLE I.

Dates	Condition	Urine Volume c.c.	Averages Total N gm.	NaCl gm.	Probable total NaCl retention gm.
Feb. 10	Day previous to treatment	1,335	9.85	8.84	
" 11	First day of X-radiation	548	6.42	1.74	7
" 12	Vomited. Specimen destroyed	?	?	?	?
" 13-20	Nauseated and eating poorly	612	9.58	2.75	?
" 20	Last day of X-radiation				
" 21-25	Eating better	806	8.55	3.80	?
" 26-29	Lamp treatment. Eating well	405	6.55	1.14	At least 11
Mar. 1-4	Lamp. 5 gm. NaCl per day. Eating well	697	7.50	2.54	" " 25
" 5-9	Lamp. 6 gm. NaCl per day. Eating well	520	6.64	2.15	" " 38
" 10-12	Lamp. X-ray. 6 gm. NaCl per day. Eating well. Urine specimens incomplete	(417)	(4.53)	(0.63)	" " 26

There would, therefore, appear to be a retention of at least 100 grams of NaCl during the observation period accepting the figure 3.80 as a *minimum* for the chloride obtained from food.

After the second period of X-ray treatment the patient was discharged from hospital. He was re-admitted a fortnight later, his general condition being much worse. Laparotomy showed that the growth involved the whole of the stomach, and that gastroenterostomy was impossible. He died six days later. During this period one 24 hours' specimen of urine was obtained, very small in amount, and showing no detectable trace of chloride.

Autopsy on this patient by Dr. D. Nicholson confirmed the previous diagnosis and laparotomy findings, there being carcinoma of the stomach, involving the transverse colon, jejunum, pancreas, and omentum. There were fibrotic and degenerative changes in the carcinomatous mass, spleen, and kidney. The kidney showed a marked nephrosis. It may be remarked that such a nephrosis is by no means uncommon in cases of intestinal obstruction. Rowntree and collaborators[7] have recently emphasized the renal involvement of patients suffering from duodenal intoxication. They reported ten cases. Five died, and at autopsy all showed nephrosis. None apparently had had X-ray treatment.

The marked features of this case are *the lessened sickness during the second period when much more chloride was being ingested*, and *the great apparent retention of sodium chloride*. We have endeavoured to trace this chloride. Chlorine might be excreted in the fæces in undue amount, in the urine in organic combination, or through the skin with excessive perspiration. No excessive perspiration occurred. A sample of fæces examined during the second period of radiation showed no more than the normal chlorine excretion by this channel. The urine examined at this time showed no organic chlorine (Cameron and Hollenber have shown that normally urine contains no organic chlorine[8]).

In discussing this puzzle with Dr. C. R. Gilmour, bearing in mind the dry chloride retention which occurs in glomerular nephritis, with the accompanying fibrosis, and also that normally such tissue as skin, hair, and nails shows the highest chlorine content of any in the body, so that these are referred to as "chlorine depôts", Dr. Gilmour made the suggestion that the chlorine might be taken up in the fibrosing of the tissues that occurred as a result of the radiation. Some of the carcinomatous tissue of this patient, and also some kidney and muscle tissue was examined. The chlorine content was high in all; it was not so abnormally high in the carcinomatous tissue as to offer a definite explanation of the chlorine retention observed. Though this explanation appears to be the most probable, yet if the chlorine can be regarded as anchored in some insoluble substance in the body, then this would appear to be widely diffused.

The blood chlorides of this patient showed no definite change during treatment.

Case 5.—J. C. L., aged 59. Carcinoma of the stomach. This patient at the commencement of observation was excreting about 3 grams of sodium chloride per day. Five grams were given by mouth daily throughout the observation period. On the ninth day he excreted 9.5 grams. Three X-ray treatments were given on the next three days; his chloride excretion averaged 7.61 grams, and the urine volume was not much affected. The average for the succeeding four days (no treatment) was 7.75 grams. Then two further radiations were given; chloride averaged 8.70. During the whole period he ate well. On the third day of treatment he was slightly nauseated at breakfast, but otherwise showed no trace of sickness. The dosage was less than in the previous cases, in all only 10 m.a. hours, with 150 k.v.

His blood chlorides previous to treatment were 0.50 per cent. The day after cessation of radiation the figure was 0.39, and next day 0.45 per cent. The corresponding blood urea figures were 12.9, 17.1, and 14.3 mg. per 100 c.c. The samples were all taken just after the mid-day meal.

Several other cases have been studied, and the results are in general agreement with those detailed.

Discussion of Results

Assuming that our conclusions are correct it may perhaps be permitted to speculate very briefly on the cause of the chloride retention, and the apparent beneficial effect of sodium chloride therapy.

The observations on case 4 indicate that the chlorine is definitely retained in the body and not excreted through some unusual channel. Such chlorine retention occurs in œdema, and Anderson[9] has noted œdema following intensive Roentgen-ray treatment. No such œdema was observed in case 4; the large retention would necessitate an excessive œdema.

Vomiting suggests itself as a means of chlorine loss, but in case 4 there was marked retention over long periods during which no vomiting occured, and in cases 1 and 5 with slight retention there was no vomiting at any time. An obvious source of error is diet variation. The diets of these patients were controlled as far as possible, and no slight variations would account for our results, especially those with case 4.

Our results suggest immediately a comparison with the chloride retention which occurs in acute pyloric and intestinal obstruction, as shown in a recent series of papers by Haden and Orr.[10] Here also, in addition to the retention, there is lowering of blood chlorides, and the accompanying intoxication is ameliorated, and in some cases cured by administration of sodium chloride, and of sodium chloride specifically, in large amounts. Dixon[11] has confirmed this beneficial effect, though Copher and Brooks[12] are not altogether n agreement.

Haden and Orr explain their results by a detoxication change represented by the equation

$$X\ (\text{toxin}) + NaCl + H_2CO_3 = X.HCl\ (\text{non-toxic}) + NaHCO_3$$

and have shown that in their cases there is distinct increase in the blood bases, as would be indicated by such a reaction.

Obviously, if such a detoxication occurs as a result of X-radiation also, then we should observe not only a chloride retention, but also a lowering of blood chlorides. Our results confirm those of Cori and Pucher regarding the first, and suggest that at any rate in some cases Schlagentweit and Sielmann's observations are correct as to blcod chlorides. Obviously, further study of acute cases of X-ray sickness is necessary for more accurate comparison, and these are, fortunately for the patient, becoming more rare.

Is it possible that there is the same underlying cause for the similar intoxications observed in these two conditions? The toxin in acute intestinal obstruction appears to be a nucleo-protein, according to Whipple and his collaborators[13], and Whipple[14] thinks that this is formed by some perverted function of the duodenum. Murphy and Brooks[15] consider that it is produced by bacterial action in the intestine. One of us[16] has obtained similar but much slighter chloride retention in animals following injection of food material bacterially decomposed in vitro.

But, however this toxin is formed it is to be remembered that Warren and Whipple[17] have shown that the intestinal epithelium is peculiarly sensitive to short-wave X-rays; this, along with the similar symptoms and chemical findings, suggests the desirability of a more exact comparable study in the two conditions. Such a study is in progress.

Since also there would appear to be a definite metabolic effect—retention of sodium chloride—from x-radiation of the upper abdomen, it seems possible that this can be utilised as a further check on X-ray dosage.

The results with X-ray therapy and intestinal obstruction suggest that there is a hitherto unconsidered detoxicating function of sodium chloride in the animal body. If sodium chloride acts as such an agent in emergency, may it not possibly play a normal rôle, chemically similar.

We wish to thank the several doctors of the Winnipeg General Hospital who have allowed us to make these observations on their patients.

The usual chemical technique (outlined in Hawk's text-book of Physiological Chemistry) has been employed. Our thanks are due to Miss J. E. Williamson for assistance in the chemical analyses.

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SOME ANATOMICAL POINTS RELATIVE TO INFECTIONS OF THE HAND*

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SINCE many infections of the hand commence in the terminal phalanx, we may consider that region first. From a surgical point of view the pulp of the finger may be considered a closed space, and such is the density of the connective tissue within this space that it tends to prevent the spread of inflammatory fluids. Should such develop the result is an increase of tension greater than is usual in other parts of the body. Necrosis of the bony terminal phalanx frequently complicates a neglected felon. The phalanges consist of a shaft and a single epiphysis, situated at the proximal end. When necrosis attacks the distal phalanx, it is the shaft which suffers, while the epiphysis usually escapes. This appears to be as true after fusion of the epiphysis as it is before. In his book on "Infections of the Hand" Kanavel has pointed out that whereas the blood vessels to the shaft pass through the pulp space on their way to the bone, the vessels going to the more proximally situated epiphysis arise higher up the finger, and reach the bone without passing through the space. According to Kanavel, increased tension in the pulp, if unrelieved, eventually occludes the vessels passing through it. These vessels supply the shaft, therefore it is that portion of the bone which suffers, while the epiphysis escapes, since its vessels, not passing through the pulp, escape occlusion. It is most fortunate for such cases that both flexor and extensor tendons are inserted into the base of the last phalanx, *i.e.*, mainly into the epiphysis, which, as we have seen, usually escapes destruction. Hence the functional usefulness of the finger is not nearly so seriously impaired as would be the case were the tendons inserted into the shaft. On the other hand, it is somewhat unfortunate that of these two tendons, the flexor tendon, which is the more closely related to the pulp, is the one to possess a tendon sheath. On this account a neglected felon occasionally leads to a teno-synovitis; and, further, a deep incision into the pulp, if prolonged too far proximally, may open the tendon sheath and infect it.

When planning an incision into the pulp, it may be well to remember that one of the functions of the skin of the pulp is that of fine touch, and it is obvious that a mid-line incision into the pulp will leave a scar which will result in the maximum impairment of this function.

In the nail region the following anatomical points present themselves for consideration. The nail itself rests upon the nail-bed, the latter being highly vascular and sensitive. With the exception of the distal free edge, the edges of the nail are more or less overlaid by a small fold of skin called the nail-fold. The proximal edge of the nail extends much further under the nail-fold than do the two lateral edges, and that proximal portion of the nail which is buried beneath the nail-fold is spoken of as the root of the nail. In all but the slightest cases of paronychia the pus is situated between the proximal part of the nail-bed and the root of the nail, which is usually lifted off the bed, though the exposed portion of the nail commonly remains attached. From this situation the pus finds egress by working its way proximally or laterally or in both directions to the edges of the nail, and around those edges to gain the superficial aspect of the

*Read at the Annual Meeting of the Canadian Medical Association, June 12, 1923.

nail, and then oozing out from beneath the nail-fold. Since the nail-root is superficial to the seat of the trouble, and thus prevents efficient drainage, the most satisfactory method of attaining the latter object would appear to be to turn back a flap of the nail-fold and remove the nail-root, entire or in part, according to the extent of the infection.

A severe or neglected infection of the last phalanx may spread upwards by the lymphatics, or, if it be on the palmar aspect, by the tendon sheath, there being no sheath on the dorsum of the digits.

The lymphatics of the hand are extraordinarily numerous, particularly upon the palmar aspect. The collecting trunks of the digits run along the sides, with the digital blood-vessels and nerves, but whereas the latter come from the palm, the lymphatics leave them at the base of the digits and run to the dorsum. In view of the fact that the vast majority of infections of the hand originate on the palmar aspect, it is of the utmost importance to realise that the vast majority of the palmar lymphatics run to the dorsum.

The deep lymphatics of the hand follow the deep vessels of the limb and end in the axillary nodes, but according to authoritative investigators there may be an odd lymph node or two scattered anywhere in the course of these deep vessels. Such scattered deep nodes may attempt to arrest the progress of an infection, and may break down and give rise to an abscess which may be situated almost anywhere in the course of the deep vessels of the limb. Apart from these occasional scattered nodes, the deep lymphatics constitute an uninterrupted path from the hand to the axillary nodes.

The superficial lymphatics, on the other hand, follow the superficial veins, and therefore lie within the superficial fascia, where they may be seen just beneath the skin as characteristic red lines when inflamed, thus giving warning of the spread of an infection.

The superficial lymphatics on the inner side of the limb accompany the basilic vein, which becomes the axillary vein, hence these lymphatics end in the axillary nodes. But some of them have interposed in their course one or two nodes just above the inner aspect of the elbow, called the epitrochlear nodes, which by attempting to deal with an infection may give warning of its upward spread.

The superficial lymphatics on the outer aspect of the limb accompany the cephalic vein which ascends between the deltoid and the pectoralis major to join the upper end of the axillary vein. Some of them may have interposed in their course one or two small deltopectoral nodes in the deltopectoral groove, but these are not at all constant. If present they may furnish a warning similar to that of the epitrochlear nodes. However, I have learned from Dr. A. T. Bazin that in the most virulent infections these lymph nodes are so overwhelmed by the toxins that they do not react at all. Thus, unfortunately, this danger-signal is absent in those cases in which it is most needed.

The cephalic vein was so called by the ancient anatomists, who obtained their knowledge from the dissection of the lower animals, because in some of them it opens into the external jugular vein at the root of the neck. At one stage in the development of the human embryo the cephalic vein opens into the external jugular, as in the lower animals, and only later does it acquire its final opening into the axillary vein. Some lymphatics from the outer aspect of the limb follow the primitive embryonic course of the cephalic vein and end in the supraclavicular nodes. It is well to recognise that in this path there may be no nodes to deal with an infection until it reaches the root of the neck.

It is highly important to remember that whereas the superficial fascia on the palmar aspect of the hand is very dense and fibrous indeed, that on the dorsum is extremely thin and loose. This fact, together with the dorsal inclination of the palmar lymphatics, explains the highly important clinical fact that sepsis in the palm commonly produces a great deal of oedema and swelling on the back. This suggests that extreme conservatism and hesitancy should obtain before such a swelling on the dorsum is incised, since in the vast majority of cases the seat of the trouble is actually in the palm.

The anterior annular or transverse carpal ligament is a dense thickening of the deep fascia, measuring about an inch proximo-distally. The flexor tendons pass deep to this ligament, which performs the important function of retaining the tendons in place during flexion, and if it be ruthlessly divided by injudicious incisions, considerable functional disability is to be anticipated. This may be avoided by an accurate knowledge of the exact situation of the ligament, concerning which erroneous ideas are by no means un-

common. My main purpose in mentioning this ligament is to emphasize the fact that it is situated not in the lower part of the forearm, nor even at the wrist, as some people suppose, but in the proximal end of the palm, stretching across between the proximal part of the ball of the thumb and that of the little finger.

From the deep aspect of the palmar fascia two intermuscular septa, a lateral and a medial, run deeply to be attached respectively to the shafts of the third and fifth metacarpals. The palm is thus divided into three fascial spaces called respectively the thenar space, the middle palmar space, and the hypothenar space from lateral to medial side. These fascial spaces of the palm are of great importance from the fact that they are the site in which deep palmar abscesses occur. Such abscesses may arise from direct infection of the spaces, or by extension of infection from a digit, either along the lymphatics or along the tendon sheaths, the latter being in intimate relationship with the fascial spaces. The middle palmar space is continuous proximally with a cellular tissue space between the deep muscles of the forearm, into which sepsis may therefore extend from a middle palmar abscess.

There are tendon sheaths around the tendons on the front and back of the wrist, but because of their greater surgical importance we shall consider only those on the front. Two of these interest us specially, a small one, around the tendon of the flexor pollicis longus, and a large one, around the tendons of the flexor digitorum sublimis and profundus, *i.e.*, all the tendons of these two muscles to the fingers are enclosed within a single large common flexor sheath. These two sheaths extend from about an inch above the wrist distally beneath the anterior annular ligament into the palm.

The sheath of the flexor pollicis longus usually continues uninterruptedly along the tendon to its insertion into the base of the last phalanx of the thumb, so that an infection of the digital portion of this sheath may spread along the sheath with great ease to the palm or even to the forearm. Not uncommonly this sheath communicates with the common flexor sheath near the wrist, and in such cases an infection of one sheath readily extends to the other.

The common flexor sheath extends into the palm beyond the distal border of the anterior annual ligament to about the level of the free margin of the web of the abducted thumb, where it ends in a series of diverticula around the flexor tendons to the fingers. Those around the tendons of the index, middle and ring fingers are small, but that around the tendons to the little finger is prolonged uninterruptedly to become continuous with the digital sheath of that finger.

The digital flexor sheaths enclose the flexor tendons as far distally as the insertion of the tendon of the flexor digitorum profundus into the base of the last phalanx. Proximally, the sheath of the little finger is usually continuous with the common flexor sheath. Because of this direct continuity between the digital sheath of the little finger and the common flexor sheath, tenosynovitis of the little finger may spread with readiness to the common flexor sheath, thus extending to the palm or even to the forearm.

The digital sheaths of the other three fingers end blindly about the level of the main portion of the distal transverse crease of the palm, a point to be remembered when incising them, for the blind proximal ends of these digital sheaths extend proximally into the fascial spaces of the palm, so that if an incision into the digital flexor sheath of one of these fingers be prolonged above the level of the main portion of the distal transverse crease, one of the fascial spaces of the palm will be opened up, and a grave risk run of infecting it. Furthermore, a neglected tenosynovitis affecting one of the digital flexor sheaths may lead to a rupture of the proximal end of the sheath into one of the palmar spaces, with the production of a palmar abscess.

Occasionally the digital sheath of the index, middle or ring finger is continuous with the common flexor sheath. In such a case tenosynovitis affecting one of these fingers is just as serious from its liability to a rapid spread proximally as in the case of the thumb or little finger. There is no method of foretelling this in the individual case, but the fact that such an anatomical condition does occur should be borne in mind as a deterrent to dilatory treatment of tenosynovitis in these fingers, under an idea of security which may prove false.

Finally, two anatomical arguments may be presented for consideration in connection with the planning of incisions into the palmar aspects of the digits. The digital sheaths act as annular ligaments to the tendons, therefore, when the flexor muscles contract, their tendons press against the ventral aspect of the sheaths in the mid-line. If an incision into a digital sheath be

made in the mid-line of the digit, the tendon will exert considerable pressure against the incision every time the finger is moved, with the production of undesirable results in some cases.

In his book on "The Principles of Anatomy as seen in the Hand" Professor Wood Jones has pointed out that the crease lines across the digits are regions of skin stasis, where the skin is anchored to the underlying parts in such a direction—namely transversely,—as to facilitate the normal bending movements of the digit. He also points out that a scar has the same structure as a skin crease, and is therefore a line of skin stasis, and he maintains that if an incision be carried at right angles through these skin creases, a line of skin stasis is created at right angles to that which the function of the part demands.*

May I be permitted to remark, in conclusion, that I am fully alive to the fact that in deciding upon clinical matters the anatomy of the affected part is only one of the many considerations to be taken into account; and that my object has been to bring forward certain points for discussion, and to present their purely anatomical aspect, holding that the final adjudication of such matters must be based upon nothing short of actual clinical experience.

*On the other hand, Mullally (*Brit. Med. Jour.*, Dec. 1, 1923; p. 1029) considers that these crease lines act as constriction bands when the digit is inflamed and swollen, and he considers it important that they should be divided.

CONSERVATION IN TREATMENT OF HAND INJURIES*

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In a retrospect of one's experiences there are many cases that exemplify valuable principles to be observed in traumatic surgery. While many of these cases have no magnitude in themselves yet they involve principles and present features that accentuate the value of conservation much more than does the average major case. Probably sometimes the minor injury does not receive its fullest consideration just because it is classed as a minor surgical affair.

While making no assertion that conservation is not always in the mind of the practitioner in dealing with hand injuries I have no apology for expressing a conviction that there are occasions of relaxed viligance when its principles and methods are not sufficiently considered and applied to the best advantage.

The whole idea of conservation is to restore the individual to activity with the least loss of tissue, of function, of time, and expense.

We must remember that industrial accidents stand second as a cause of permanent disability and that this disability is the concern not only of the patient and his attendant but also of the employer—the Compensation Board, and the community, and frequently subjects the practitioner to a close scrutiny and criticism of his treatment and its end results.

The moment one is confronted with the treatment of an accident case it becomes necessary to make a rapid survey of the whole situation with the hope of seeing in prospect the dangerous curves in the road ahead and how best to avoid further possible disaster.

The occasion of a trauma is the incidence of more or less severe damage resulting in destruction, it may be of valuable structures and ultimate impairment of function. Generally the trauma also involves a wound subjected to sevère infections superimposed on the damaged and devitalized tissues and occasionally accompanied by an impaired vital resistance through haemorrhage. Preliminary to treatment of such a case the greatest caution is needed in making at a glance an accurate survey as the basis for exercising good judgment. Included in this survey should be the health of the patient previous to the injury; the type of occupation; the nature of the employment with a view to estimating chances of sepsis or other types of dangerous infection; a care-

*Read before the Winnipeg Medical Society, April 18th., 1924.

ful and rapid estimation of the damage done to structures and the effect of such damage in temporary or permanent impairment of function.

A careful sizing up of these considerations should enable one to estimate with a fair amount of accuracy what the case involves, and what measure of chances the patient under various lines of treatment may have of recovery. Experience should enable one to anticipate what lies ahead. While every case is different from others yet all follow a fairly regular line of progress toward recovery or otherwise, and with this which is frequently a long programme, the surgeon should have in prospect a clear understanding of possible complications. Seldom do cases present features so serious that the life of the patient is the first concern. The line of treatment inaugurated from the commencement has to concentrate rather on securing the highest possible percentage of restoration of tissue and consequent freedom from deformity and from impairment of function. One must therefore anticipate steps in plastic repair—it may be at some distant future date essential to securing the end results. Included in the treatment full recognition of the value of physiotherapy must also be given without which such a high degree of impairment unnecessarily results.

In the hope of making the best use of the brief time at my disposal I would ask your attention to a few cases illustrative of conservation in the treatment of hand injuries.

Case one—was that of a carpenter who injured his left hand while splitting firewood. With his one hand on top of the block, the axe in the other in its downward course became suddenly diverted, and completely severed the thumb from the hand, with the exception of a portion of the web adjacent to the index finger—about two-thirds the size of a lead pencil. (Fig. I). The cut therefore involved a complete severance of the distal end of the metacarpal of the thumb—traversing a part of its articular surface—and also severance of all the tendons and other soft tissues except the narrow strip of skin and subcutaneous tissue at the margin of the web.

With the thumb so completely severed from the hand in all its functioning parts the first impulse was, to at once snip off the remaining portion and consider methods of closure. However, having observed the severity of the trauma and realized the impairment of function which would certainly result from the absence of the thumb—the adoption of the most conservative procedure even though it offered very small chance of success seemed to be not only warranted but urgent. Fortunately in this case the cut was made by a fairly keen edge—the axe having been sharpened that same day, and crushing of tissue was not present therefore in an average amount for such an injury. This was greatly to the healing advantage of the case. Then, too, the wood was tolerably clean and a minimum of infective contamination from that source could be expected. The stump also possessed an excellent blood supply which improved chances for success; especially since circulation through the slight attachment of uncut tissue was likely to be a valuable factor in maintaining vitality until additional circulation was established in the healing process.

CASE I.—FIG. I.

But results in such a case were to be dependent largely on the method of treatment from the first. Antiseptics used here in the usual manner would most probably destroy all chances of success. To treat such a wound with Tr. Iodine was likely to further devitalize and produce certain death to the severed portion. No antiseptic procedure was used, therefore, except mechanical cleansing of the wound, removing fragments of bone and frayed tissue, etc.—likely to cause trouble through complete devitalization, and infection. The antiseptic resistance of the tissues and blood clot alone had to be counted upon for taking care of the wound—throughout its deeper parts. A free haemorrhage no doubt assisted in removing infection.

The flexor tendon fragments were secured and sutured with chromic catgut. The extensors similarly treated and a suture was placed in the periosteum to steady the bone fragments. Suture of the skin was then made by three stitches equally disposed around the margin. This gave fair adjustment of the main structures within as well as closure of the skin. All sutures were so inserted that the least possible amount of tissue would be included consistent with holding, this, to avoid necrosis.

A roll was then prepared of sufficient size that the hand would accommodate it within as a splint —maintaining the thumb in the position of partial flexion—this being the position best adapted for average function if ankylosed. It was too much to expect that ultimate recovery would give function of the metacarpophalangeal joint on account of injury, or that function of the phalangeal joint would be restored on account of the anchoring of the tendons.

After an application of very weak iodine about the skin margin of the closed wound the hand was dressed in the usual way and splinted and the whole bandaged lightly. Bandage pressure was avoided—as being disposed to embarrass what little circulation was possible. Encasing the whole was a starch bandage with the object of splinting the part more effectively.

The detached portion at first was practially lifeless in appearance. On dressing two days later it was deeply cyanotic in colour—and this in the course of several days became transformed into dark red showing that circulation was improving. Ninety-five per cent. of the wound healed by first intention and organization of blood clot. What little of sepsis threatened, occurred at superficial points where slight crushing of the tissues was present as an additional damaging feature. By precaution in dressing using alcohol and no watery solution for cleansing, the slight infection remained well localized.

FIG. II.

As anticipated, the softer tissues of the thumb became atrophied and remained so a long time. The thumb was devoid of feeling and was ankylosed. But it has largely recovered from the atrophy and sensation defects, and for years since the patient has been working at his trade with very little handicap from the injury. (Figs II and III).

FIG. III.

Case two—was that of a store-keeper who while preparing an order for cooked ham was cutting the same on a rotary meat slicer, and inadvertently took a slice from the index finger of his right hand. The slice, about one inch long, was from its palmar surface and involved about one-third of the circumference of the finger. (Fig. IV.).

Profuse bleeding caused much excitement during which no thought was given of the fragment removed. With hand tied up he came half a mile to my office for dressing, but on seeing the amount of finger he had lost we repaired to his store to recover the fragment. Further delay was occasioned by our inability to find it, but finally on ransacking the contents of an undelivered parcel we located the piece of finger with its cut surface against a slice of cooked ham. It was by this time fully half an hour after the accident, but somatic death does not always take place very suddenly and several features in the case

CASE II.—FIG. IV.

gave promise of the viability of the fragment, and made it seem advisable to replace the same. Among the conditions which favoured success were, the cut had been made by a very sharp knife edge, causing little trauma of a crushing nature to the tissues, the man was a healthy subject and his hands were in good condition, moreover the meat was cooked and therefore practically sterilized at least in its interior. Against one of the probably sterile surfaces of a slice the cut surface of finger fragment had been stored by kind fate till found, and the chance for sepsis in the case was therefore considerably reduced. An excellent blood supply to the finger also gave prospect of ample nutrition to the one side of the graft contact.

Therefore, in spite of the fact that the fragment had been removed for over half an hour and was cold and bloodless, the possibility of it growing seemed reasonable and if attempted with success it meant probably a more speedy recovery, an absence of deformity, and a better ultimate tactile sense, which was a most important consideration for the right index finger.

To reduce the possibility of contamination from contact with cooked meat, the fragment of finger was washed in normal saline before replacing. No sutures were used, only a slender ribbon of gutta percha tissue wrapped about the finger held all in place. Dressings were lightly applied and recovery went on uninterruptedly. The only part hesitating to heal was the thin edge of the fragment where the entering edge of the knife had crushed the tissue more than elsewhere. It now requires close inspection of the finger to locate the graft. Sensation is practically normal.

Case three—is that of a hand of which the dorsum came in contact with a circular saw which cut a deep trench about half an inch wide obliquely across the middle third of the metacarpal bone of the thumb. The cut in the skin was about one and a half inches long. It caused complete severance of the extensor tendons, brevior and longior, and transversely cut through half the thickness of the shaft of the metacarpal bone. (Fig. V.).

CASE III.—FIG. V.

These saw wounds are practically always ragged at the edges and unusually prone to sepsis on that account. Successful repair of tendons involved is therefore more difficult. A shortage of tendon material resulting from the accident increases the difficulty. Added to this, one has to anticipate with certainty that anchorage of the tendons to the bone in a case of this type will develop and greatly impair function through inability to extend the thumb. This complication is much worse to deal with where the skin has an extensive scar. Secondary operation to release the tendons from the bone must be counted upon from the very first dressing of the original wound. As far as possible obliteration of the scar in the skin should be aimed at when making the first attempt at repair, otherwise separation of an extensive scar in the skin and tendon from its

foundation of attachment beneath may possibly deprive it of nutrition to the extent of causing necrosis in the skin scar. In a wound which has healed under septic conditions such a necrosis accompanied by infection is usually liable to occur, if an early attempt is made at secondary operation. Potential sepsis is present in such scar tissue for many weeks after complete healing has been accomplished.

The subject of this accident was a woodworker and chances for controlling sepsis were, therefore, fairly good. To reduce the amount of scar in the skin I did not hesitate to thoroughly treat the wound with iodine and then undermine the skin layer for some distance lateral to the wound. This gave sufficient covering when stretched to make complete closure even after the ragged edges had been trimmed off. With the thumb in position of extreme extension tendon repair was done with difficulty, and splinting in this position until healed was necessary to avoid tension on the tendon and necrosis at its sutures. Drainage of course was instituted in the form of a small twisted rope of silk-worm gut removed about the third day. Little superficial trouble from infection was encountered and good tendon repair was secured. Had this patient been an employee of a packing plant subjected to the infections and cold and moisture often present there, one would not have ventured upon skin shifting with the risk of opening up other layers of tissue and the chance for more widespread sepsis.

About two months and a half later, healing having been complete for some time and the two joints of the thumb having been well loosened by massage as well as by work to which he had returned in the meantime, secondary operation was attempted to release the tendon at the point where it was extensively anchored to the bone. Incision was made about three-quarters of an inch distant toward the ulnar side of the scar, and parallel with it, and the skin undermined over to and beneath the tendon separating the attachment to the bone. Into this pocket a portion of fatty fascia was transplanted from the thigh and the wound closed. Active and passive physiotherapy were resorted to regularly after a few days and the hand has returned to almost normal function.

Case four—is that of a woodworking machinist who previously by accident had lost practically all of the two terminal phalanges of the index and middle finger on the right hand. The accident with which I was concerned was the result of contact with a circular saw resulting in a wide wound to the dorsum of the index, middle and ring fingers. The index finger was deeply trenched over the knuckle, its extensor tendon severed, the joint opened, and the head of the metacarpal partially cut out and the balance fractured from the shaft. The middle finger also had its extensor tendon severed, its phalanx cut deeply and fractured about the centre, and its flexor tendon also completely severed. This, with the collateral trauma to the remaining tissues, left only intact the palmar skin and fascia, holding the middle finger fragment to the hand, intact. The third finger was rather badly cut on the skin of the dorsum and some deep scoring of the extensor tendon. (Fig. VI.).

Case IV.—Fig. VI.

In an open wound with so much laceration the chances of successful tendon repair together with closure of the wound without sepsis is a serious problem. Added to this in the present instance was the compound fracture of both bones, the opening of the metacarpo-phalangeal joint, and the severance of the flexor of the middle finger. To remove the two fingers at the knuckle joints seemed the most ready way out, but would have resulted in a very heavy handicap to the function of the right hand. To retain the index finger while removing the middle finger which seemed almost imperative meant that the index finger would be deprived of valuable lateral support so essential in firmly grasping things. I resolved, therefore, to try and save both.

The wound was thoroughly swabbed out with

iodine. The several tendons were secured, and similarly treated. The flexor tendon of the middle finger was then sutured. The phalanx of the middle finger was too badly damaged to fix by splinting alone and had to be drilled and laced by a suture of kangaroo tendon and further supported by splinting in the palm. The extensor tendons were sutured, as far as the fragmentary portions would go. Closure of the wound was made by loosening up a large area of skin over the back of the hand, and by skin

FIG. VII.

FIG. VIII.

shifting and stretching, the defect caused by the saw was well covered. Drainage was inserted consisting of silk-worm gut in a twisted rope. Recovery was made very nicely, largely by reorganization of blood clot and granulation. Slight local but not prolonged discharge occurred and the ultimate result well repaid the time and effort of all concerned as will appear from the excellent function shown in the photographs. For many months since, the patient has carried on, and has excellent assistance from the hand. (Figs. VII. and VIII.).

In closing may I recapitulate by stating briefly some of the main points:

1. Conservation should be observed with unusual care in dealing with wounds of the hand.
2. No tissue should be sacrificed unless necrotic or wholly detached from blood supply.
3. Sterilization by mechanical and chemical means is a most important requisite and should be as thorough as possible consistent with vitality of tissues.
4. While hæmorrhage and shock in severe cases may make first demand on treatment, reconstructive measures should be studied from the first and commenced early.
5. The intricate mechanical nature of the hand and the diversity of its functional activities are sometimes important features for consideration in determining what line of treatment is best suited to the case since treatment may vary for individuals of different activity.
6. The placing of sutures should be made with deliberation if one would avoid causing unnecessary devitalization, necrosis and suppuration, and occasionally sutures should be avoided altogether.
7. Drainage should be provided for in practically all cases and the closest watch kept for its further necessity.
8. The generous blood supply of the hand makes possible healing results not elsewhere obtainable.
9. An efficient splinting, a freedom from bandage pressure, and avoidance of the dependent position are large factors in assisting healing and making the patient comfortable.
10. Physio-therapy should be commenced early and persisted in—at first combined with baking and massage and later substituted for by manual work.
11. If ankylosis is certain to develop one should see that the position adopted is the one best suited for function under such conditions.
12. Treatment should be instituted early after injury to secure the best results with the least possible interference by infection from wound contamination.
13. The practitioner in charge of the case

should himself do the dressings for the first few times if he would avoid the occasional liability to further trauma by separation of blood clot and unnecessary spread of infection resulting from dressings done by one unacquainted with the wound.

14. Conservation may result in the retention of functionless or worthless portions—necessitating amputation later—especially is this so after crushing injuries. This does not argue against the advisability of conservative methods. It is surprising what functional recoveries take place. The practitioner is well advised to be extremely conservative until his experience enables him to foresee end-results very definitely.

THE EPIDEMIC OF VIRULENT SMALLPOX IN WINDSOR AND THE VICINITY*

February, 1924.

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IN the latter part of February, Windsor and the vicinity experienced an outbreak of smallpox unusual in origin, often unusual in transmission, irregular in type, and shockingly virulent, but yielding, as all smallpox yields, to vaccination. This paper is an attempt to set forth the main features of this epidemic.

Origin of the Epidemic.—The origin of the epidemic was unusual. On February 2nd., G. D., a respected citizen of Windsor, came down with an extraordinary sickness from which he died on February 11th. He was seen during his illness by four physicians, including two experienced consultants. There is now no doubt that this man's illness was hæmorrhagic smallpox but the disease was so irregular that it was not recognized. It was only when persons who had been in contact with G. D. began to come down ill with the symptoms of smallpox that there was any suspicion as to the true nature of his malady. Very soon it became plain that the disease was not confined to the Border Cities but had broken out in Amherstburg, Maidstone, and Detroit, Mich., U.S.A., all originating in the one missed case. The total number of cases of smallpox in all these places was sixty-seven and the number of deaths was thirty-two.

Difficulties in Diagnosis.—One of the outstanding features of this epidemic of smallpox was the irregular character of a large proportion of the cases and it may be useful to present some of the unusual cases briefly.

To consider first the original missed case.

Case 1.—G. D. This man took sick on a Saturday night with a violent headache, vomiting, sore throat, and some general pains in the back and elsewhere. On Tuesday he broke out everywhere with a rash resembling urticaria such as often follows the administration of diphtheria antitoxin. His whole body was covered by raised irregular blotches of all shapes and from a bean to an egg in size. On Wednesday this rash was a light brown in colour. His principal complaint was a persistent headache, sore throat, and sore mouth. He had been in the past troubled with repeated attacks of sore throat; his teeth also had bothered him a great deal and he had intended having them all out because of pyorrhoea. His temperature was about 101°, he was perfectly rational, answered questions readily, even rose to laughing at a joke. He readily sat up in bed, opened his mouth, put out his tongue and said "Ah" to have a throat swab taken. He was unvaccinated but gave no history of exposure to smallpox. There was no particular change in the symptoms except that the rash became darker as the days went by and about two days before death occurred there was hæmorrhage from the bowels. . The diagnosis made by all physicians who saw this man was purpura hæmorrhagica and it was believed that the root of the trouble lay in the sore throat or bad teeth of the patient.

*Issued by the Provincial Board of Health, Ontario.

It is to be remembered that this case came out of a clear sky, that each of the physicians who saw the case was experienced in the diagnosis of smallpox and that in spite of this the diagnosis was completely missed; at no time during the epidemic which followed did a case occur that looked in the least like this first one; the source also of the infection of this initial case has not been discovered.

Case 2.—J. I. On Wednesday, February 20th., this man took ill with severe headache and pain which the physician thought at first was in the patient's back, but on further examination seemed to be in the abdomen extending down into the groin. He was unvaccinated but gave no history of contact with smallpox and was sent into one of our general hospitals as a case of surgical kidney. That was late Wednesday night or early Thursday morning. On Friday morning he broke out in an intense red rash which is so well described in the chapter on smallpox in Ker's *Infectious Diseases* that the description is given *verbatim.*

"A very interesting and ill-omened form of erythema, which is sometimes classed as scarlatiniform, but which has distinct characters of its own, is the rash which is called by French authors "le rash astacoïde" or the lobster rash. This is a very vivid and intense erythema, almost erysipelatous, of a most brilliant red colour, approaching more the tint of scarlet than anything ever seen in scarlet fever. It is general all over the body and involves also the face, which is usually congested and puffy. It only occurs in hæmorrhagic cases, and is therefore of grave prognostic significance. It is early followed by hæmorrhages into the conjunctive and later over the surface of the skin."

This patient died twenty-four hours later with hæmorrhages from the bowel and under the skin everywhere. His temperature never exceeded 101°. His total illness was under four days. He had never been vaccinated. He had been asked if he had been in contact with smallpox and said "No." As a matter of fact he had visited Case No. 1 but at the time he took sick he did not know that G. D.'s illness was really smallpox.

Case No. 3.—On Sunday, February 24th., M. B., a trained nurse, aged 34, was sent from out of town into the other one of our general hospitals and had her appendix removed the same night. Haemorrhage had occurred in the distal end of the appendix. During Monday night she broke out with a mixed kind of rash. Her face was flushed as with scarlet fever but the eyes were inflamed. There was a rash on the body which resembled measles. She had come off a scarlet fever case two weeks before but believed that she had had scarlet fever as a child. She had no sore throat and no strawberry tongue. The inflamed eyes with a rash on the body rather pointed to measles but there was no typical measles rash on the face, no spots in the mouth, no cold in the head nor bronchitis. She had never been successfully vaccinated but had not been exposed to smallpox as far as she knew. The case was not believed to be smallpox but in view of the uncertainty of the diagnosis the case was isolated and the nurse who was caring for her was vaccinated at once. Wednesday the patient continued much the same; Thursday it was learned that the patient's brother had smallpox and the home was in quarantine; Friday there was blood in the urine and on that day we allowed the patient to go home, where she died a few days later. Exposure to smallpox was traced later.

Case 4.—At about the same time a man was sent into one of our general hospitals vomiting blood and passing blood from the bowel. He had a fever of 101.5°; no history that would point to gastric ulcer or anything of that kind and no signs or symptoms that would point to typhoid. He had been vaccinated successfully in childhood and again about ten years ago and still again since the beginning of the epidemic, the last vaccination not having taken. The patient was thirsty and had the typical appearance of a straight hæmorrhage case but not knowing precisely what was wrong with him we had him strictly isolated. Later on we concluded that his hæmorrhage was due to taking 105 grains of aspirin in fifteen hours. He recovered.

These cases will, I think, serve to illustrate some of the difficulties we had in the way of diagnosis in the presence of an epidemic of irregular smallpox. Ordinarily the differential diagnosis of smallpox is from influenza, chickenpox, drug rashes, and perhaps syphilis and impetigo. These were not the diseases we had to consider, but scarlet fever, measles, erysipelas, surgical conditions of the abdomen, aspirin poisoning, peliosis rheumatica and exfoliative dermatitis.

We have made an attempt roughly to classify the types of cases seen in the Border Cities. All counted we had in the Border Cities thirty-four cases of smallpox. Eight of these were in persons who had been vaccinated years before and all of these cases were perfectly clear cases of smallpox. Six cases were vaccinated during their incubation

period and came down with smallpox and a taking vaccination. All of these were also perfectly plain cases of smallpox, offering no difficulties in diagnosis. Twenty-one cases had never been successfully vaccinated at any time in their lives and of these no less than eleven were irregular in type. Of the eleven distinctly irregular cases, one had a rash which might be described as hæmorrhagic urticaria, six had lobster rashes more or less complete, one had lobster rash on the face and a measles-like rash on the body, three had a flushed face and a smallpox rash which came out late and badly. It is to be noted that not one case presenting the features of irregularity that have been described recovered from the disease.

Cases of Smallpox without a rash.—Not included in any of our figures as actual smallpox were eight cases in the Border Cities and three at Amherstburg presenting the following features. They were all in persons vaccinated before and having good scars, ten years or more old. They came down ill with the usual symptoms of smallpox—fever, headache, backache, prostration, and so on. After an illness of three or four days they recovered completely without developing a rash. We are inclined to the opinion that these cases were true infections but the evidence is not conclusive.

Methods of Transmission.—Smallpox is usually transmitted by at least a fairly intimate contact with a case and ærial infection, fomites, third person carriers; and cases having symptoms but no rash play a relatively small part in transmission. In our epidemic these unusual methods of transmission played a very considerable part. Out of a total of sixty-seven cases these unusual methods of transmission apparently operated in no less than twenty-nine.

Measures adopted to control the epidemic.—When the epidemic first broke out there was a period of two or three days in which we were not certain that we were really dealing with an outbreak of smallpox. The cases were irregular and it was only after we had seen two or three typical cases that we were sure of what we were dealing with. While certain preliminary steps had been taken two or three days before, it was on Saturday night, February 23rd., that the Board of Health met to determine what measures should be taken to check the epidemic. By that time we knew that the disease we were dealing with was smallpox; that the community was seeded with cases, and that it was an exceedingly virulent and irregular form of the disease. The Local Board of Health for the Essex Border Municipalities has a distinctly unusual composition. The Board has jurisdiction over six municipalities, and every member of the Board is a doctor who has at some time been a medical officer of health himself. The measures decided upon by the Board were as follows: Provision was made for the care of the sick and the maintenance and medical supervision of families in quarantine, but the most vital decision of the Board was in respect to vaccination. The Board was a unit in the opinion that the one thing that would stop the epidemic was vaccination of the whole population. Our population is about 70,000 persons and the problem before the Board was to get that population vaccinated in the shortest possible period of time. The procedure decided on was as follows. Then and there three of our nurses using three phone lines called up every doctor in the Border Cities that could be reached and asked him if in the emergency he would consent to vaccinate any person who came to his office free of charge, with the definite understanding that the Board of Health would supply vaccine and pay for vaccinations at the rate of 25c. apiece. Within half an hour we had the consent of about three-quarters of our doctors. The rest could not be reached but we assumed their consent and telephoned them Sunday morning. Before midnight a statement of the situation was prepared and sent out to every clergyman in the Border Cities, with a request that it be read from the pulpit at every service on Sunday. The gist of the announcement was that an epidemic of exceedingly severe smallpox was present in the Border Cities, that there had already been a number of deaths and that everyone was advised to be vaccinated at once and to have all the members of his household vaccinated, finally, that arrangements had been made with every doctor in the Border Cities under which he would vaccinate any one who came to his office free of charge. On Sunday at our request the secretary of the Chamber of Commerce called up every large employer of labour, explained the situation to him and asked him to urge vaccination upon all his employees Monday morning. Monday afternoon a full page advertisement of the Board of Health setting forth the situation appeared in the local paper.

The effect of these measures was all that we could have asked for. There are some seventy doctors in the Border Cities and we had simply created seventy free vaccination stations. The doctors' offices

began to be crowded with applicants for vaccination on Sunday morning and within the next six days we estimate that well over ninety-five per cent. of our population was vaccinated. There was nothing compulsory about any of our methods. We simply took the public into our confidence, told them the situation as it really was, advised general vaccination and made provision for it without charge. The anti-vaccinationist, usually so noisy and troublesome, gave us no trouble at all. As far as checking the epidemic was concerned the effect of these measures was perfect. We had one big splash of cases and then no more and this freedom from any recrudescence has continued without interruption right up to the present moment, almost three months.

Vaccination.—The total figures for the whole epidemic covering the Border Cities, Amherstburg, Maidstone and Detroit are as follows:

	Cases	*Deaths*	*Mortality*
Never successfully vaccinated.	45	32	71%
Vaccinated successfully 12 to 65 years before.....	10	0	0
Vaccinated successfully in incubation period *i.e.*, came down ill with smallpox and a taking vaccination.....	12	0	0
Totals.....	67	32	48%

You will note that no person who had ever been vaccinated successfully at any time in his or her life, whether it was in the incubation period of smallpox or years and years before, died of smallpox. You will note also that of the persons who had never been successfully vaccinated and who developed smallpox seventy-one per cent died of the disease. That is a wonderful story in regard to the efficacy of vaccination as mitigating the severity of the disease, but the figures by no means tell the whole story.

A few persons who had never been successfully vaccinated recovered but they all had severe attacks and had a terrible fight for their lives.

On the other hand persons who had been previously vaccinated successfully, no matter how long before, had mild attacks. Incidentally it should be mentioned that no one vaccinated successfully within twelve years took smallpox at all. But the real marvels of vaccination can, in my opinion, be appreciated only by personal experience in an epidemic such as we went through in the Border Cities. I feel that I might very well close this paper by telling you of some of our actual experiences.

In Windsor there is a family named M—, consisting of ten persons. All of them were exposed to smallpox and about equally. Nine of them had been vaccinated successfully in previous years and none of these contracted smallpox. The tenth person had never been vaccinated, contracted the disease and died inside of four days of the hæmorrhagic lobster rash type of smallpox.

During the epidemic we had to employ a large number of nurses to look after the sick and we had also to expose to the disease orderlies, ambulance drivers, clergymen and others. We made it an absolute rule that no one should be exposed to smallpox through our action unless that person had a vaccination scar already and was also freshly vaccinated by us. The result of this precaution was that not a single person who was exposed to the disease through any action on our part came down with smallpox.

Of course when a case of smallpox developed in a household we vaccinated every other person in the house. Contacts of this kind which in Maidstone, Amherstburg, and the Border Cities run into the hundreds, all, as far as I know, escaped smallpox as a consequence of timely vaccination.

In Windsor a certain Mrs. McL., 62 years of age, never vaccinated, developed smallpox and died of it. Her husband, 72 years of age, vaccinated successfully 62 years ago, had a trifling attack of the disease.

Mrs. J. D., of Walkerville, 52 years of age, never vaccinated, developed smallpox and died after an illness of eight days. Her husband with a history of exposure many times in excess of that of his wife, had a trifling attack of smallpox. He had been successfully vaccinated twelve years ago.

The proprietor of a laundry came down sick with smallpox and on investigation it was found that out of a total staff of twenty-five per ons at the laundry he alone was unvaccinated and he was the only one who contracted the disease.

A. D., age 50, and his son R. D., age 25, neither having been successfully vaccinated, died of smallpox. Mr. A. D., vaccinated successfully thirty-two years before, took smallpox also but it was a trifling illness.

Mrs. B., of Windsor, came down with a mild attack of smallpox. She is fifty-eight years old. When she was eight years old she went into a convent for three years and in the first of those years she was vaccinated successfully. As a result of that vaccination fifty years ago her attack of smallpox was a negligible affair. The scar on

her arm is so faint that it can be recognized only by careful search in a good light.

G. D., the man who had the original illness that was smallpox but was not diagnosed as such, had a daughter Josephine, twelve years old. She was exposed to her father through the whole course of sickness and later on to her mother and aunt who d veloped smallpox *but she has not had one single day's illness herself.* Six years ago she was vaccinated to go to s hool and she has on her left arm a scar about the size o an old fashioned Canadian five cent piece. Twenty-one close relatives of this little girl, all unvaccinated, are dead of smallpox

It is when one has had close personal experience with incidents such as these, when one has had to send nurses by the dozen up against the most virulent smallpox with nothing to protect them except vaccination and they nurse the disease week in and week out without contracting it, when one has seen a community of thousands of persons threatened with decimation by smallpox and one has seen wholesale vaccination pull the disease up short and weeks and weeks go by without any fresh cases at all, then and then only does one fully appreciate the marvellous gift which Jenner made to science and to humanity.

Lessons to be learned from the Epidemic.

1. Exceedingly virulent smallpox is present in the province.
2. Irregular forms of the disease presenting great difficulties in diagnosis, are ap to occur.
3. The disease may be transmitted through unusual channels and quarantine of cases and all contacts should be very rigid.
4. Vaccination is the one sure weapon against the disease.

In this epidemic—

(*a*) No one vaccinated successfully within twelve years contracted smallpox.

(*b*) No one ever vaccinated successfully, no matter how long ago, died of smallpox.

(*c*) Of the smallpox cases in persons who had never been successfully vaccinated, 71% died.

(*d*) Vaccination of almost the whole population stopped the epidemic abruptly and completely.

Postural Defects Affecting the Rectum.—A variety of pains referred to the ano-rectal region but of obscure origin, are believed to be due to a faulty sitting posture. These pains are referred through the sacral plexus. Orthopedists recognize four points in the spine usually strained and of these the lumbosacral region is the part most exposed to pain. Strain results from weight and pressure applied to the coccyx and sacrum from unnatural directions. The skin over the coccyx and sacrum show keratoses, while the usual keratotic areas over the tuberosities of the ischia are absent. The diagnosis is made from the history of vague pains, the characteristic skin changes, and absence of lesions in the bowel.—*Trans. Am. Proctological Soc.*, 1924.

Heredity and Hypertension. — James P. O'Hare, William G. Walker and M. C. Vickers, Boston, analyzed the family histories of 300 unselected cases of permanent hypertension. In 204, or 68 per cent. of this group, there was a definite history of apoplexy, heart disease, nephritis, arteriosclerosis or diabetes in one or more members of the patient's family. The number of relatives with vascular disease averaged 2.5 per patient, with the minimum one and the maximum nine. The large bulk of the relatives that had vascular disease, had heart, cerebral or kidney disease. The authors feel that these cases demonstrate rather conclusively that a family history of heart, kidney, cerebral disease, etc., is almost twice as common in a patient with hypertension as in the ordinary patient who has no increased blood pressure. Nature very frequently sounds a warning as early as the second decade in life of the possible development of hypertensive disease in the fourth or fifth decade. Such symptoms include frequent epistaxis, abnormal flowing at menstruation, migraine, cold, sweaty and cyanotic hands, flushing, blushing, extreme sensitiveness, a high strung and nervous temperament, etc.—*Jour. Am. Med. Ass.*, July 5, 1924.

A FEW REMARKS ON PROPHYLAXIS IN OBSTETRICS

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THE whole trend of modern medicine, in all its branches, is towards prevention of disease, and in this praiseworthy movement obstetricians, the world over, are keeping up with their professional brethren in the other branches of medicine. Prophylaxis in obstetrics has the following objectives:

(1) The production of a healthy, living fœtus in a healthy mother.

(2) The delivery of a healthy, living child without damage to the mother.

(3) The ensuring of a healthy, post-natal period for the mother.

(4) The safeguarding of the infant after birth.

The production of a healthy, living fœtus in a healthy mother is brought about by medical supervision of the pregnant woman, and has come to be known all over the civilized world as antenatal or prenatal care. The value of antenatal care as a means of saving, not only of maternal life, but also of fœtal life, is being more and more recognized as the years go by, and the old obstetrical axiom, "sacrifice the child to save the mother", should be changed to:—"save the child without adding to the risk of the mother". To the late Dr. J. W. Ballantyne, of Edinburgh, belongs the honour of being the first obstetrician in the British Empire to realize that something could and must be done to check the appalling mortality amongst mothers and infants during pregnancy and labour, and he devoted the latter part of his life to this all-important subject.

To ensure that any woman liable to become pregnant is in every way healthy and fit to bear healthy children, one would have to begin with her ancestors, and that is obviously impossible in dealing with women of the present generation, but one can do much to see that the potential mothers of the future are as healthy as present medical science can make them. The first essential along these lines is to do what one can to ensure the health and well being of the infant, *in utero*, during birth, in infancy, and in childhood.

Again to do everything possible to ensure a healthy intra-uterine existence, one would have to investigate the health of both the father and mother before marriage, and this leads us into the debatable question of eugenics, a question that is obviously outside the scope of these remarks. In dealing with the present generation, one's only hope of influencing the production of a healthy, living fœtus in a healthy mother, lies in giving the mother adequate antenatal care as soon as the fact of pregnancy is established, and to do this one must have full cooperation from the patient. Antenatal care, to bring about the best results, should begin as soon as a woman knows herself to be pregnant. That is when she should engage her medical attendant, and when that important step is taken, the responsibility for her safe conduct through the perils of pregnancy, labour, and the puerperium, belongs to the physician, and foolish indeed is he who accepts this responsibility lightly.

The question as to whether pregnancy and labour are to be considered physiological or pathological is one that admits of much argument. De Lee, of Chicago, asks this question, "Can a function so perilous that, in spite of the best care, it kills thousands of women every year, that leaves a quarter of the women more or less invalided and a majority with permanent anatomic changes of structure, that is always attended by severe pain and tearing of tissues, and that kills from three to five per cent of children—can such a function be called normal?" Many other obstetricians of note combine in deprecating the popular fallacy that child bearing is a physiological condition. I think that the idea prevalent in the minds of some physicians and many patients, that pregnancy and labour are physiological is responsible for much of the laxity that undoubtedly exists to-day in the medical supervision of pregnancy. On the other hand, if these processes are considered pathological, there is a grave danger of undue interference with nature and one must not allow oneself to be rushed into operative interference without adequate cause. From my own observations in maternity hospitals in Great Britain, I am of the

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opinion that pregnancy and labour should be considered pathological, but should be treated along conservative lines maintaining an attitude of masterly inactivity rather than one of injudicious activity.

If then one considers pregnancy and labour pathological, it is incumbent upon all who undertake to guide a pregnant woman safely to motherhood to use all the means at their disposal, and they are many, to help her to escape the perils that may beset her path. When a physician is first engaged to attend a woman in her confinement, he should take a complete history, paying particular attention to those points having a direct bearing on the obstetrical aspect of the case. These should include: (1) Her menstrual history. (2) History of previous pregnancies and labours, if any. (3) Details of the last labour such as, duration, normal or instrumental, weight of baby, length of stay in bed, and nature of puerperium. (4) History of previous illnesses, from which valuable information may sometimes be gained, as to what one may expect when the patient is called upon to bear the extra strain of pregnancy and labour. (5) History of the present pregnancy. A complete physical examination should be made, including the teeth, throat, thyroid, heart, lungs, breasts, and abdomen, and the presence or absence of varicose veins noted.

If one sees the patient for the first time in the earlier months of pregnancy, abdominal palpation will not give much information, except that the height of the fundus may verify the period of gestation as calculated from the last menstrual period. Pelvic mensuration is essential and if done at the first examination, there will be no risk of the physician being called upon to deliver a woman, knowing nothing about her pelvis, owing to the fact that through carelessness or disinclination, she has failed to return for examination at the stated intervals. The essential external measurements are, the intercristal, the interspinous, and the external conjugate, and if the patient is lame or shows any sign of hip or spinal deformity, the right and left oblique diameters should be taken, and the pubic arch palpated to give one some idea of the size of the outlet. These measurements give one an idea of the type of pelvis with which one has to deal, rather than of its actual size, but if the patient is a multipara and has had a normal sized baby without undue trouble, they are sufficient. In dealing with a primipara, I think one should always make an attempt to estimate the conjugate vera by taking the diagonal conjugate and subtracting from it one-half to three-quarters of an inch.

The blood pressure should be taken and the urine should be examined, and finally the patient should be instructed as to her clothing, diet, exercise, and care of the kidneys, bowels and breasts. She should also be told to return every four weeks up to the thirtieth week and every two weeks after that, bringing a sample of urine every time for examination. She should also be told to report at once any symptom that annoys her es pecially bleeding, œdema, headaches, eye symptoms, or any diminution in the amount of urine passed daily.

The question of a vaginal examination sometimes requires considerable tact on the part of the physician, and it is really not necessary at the first visit unless the patient will be unable to keep in touch with her physician, in which case it will be advisable to examine her when the opportunity presents itself. A vaginal examination should, however, be made sometime during pregnancy and before the thirty-fourth week if possible.

By this time the physician has a good idea of the general and obstetrical condition of his patient and if his examination has revealed nothing abnormal, he can assure her that everything is normal and she need not worry At each subsequent visit the urine is examined and the blood pressure is taken, and the patient questioned concerning the amount of urine passed. If albumin is found in the urine, the patient must be put on treatment at once, also if the blood pressure is found to be raised, as it must be remembered that a rising blood pressure may be the first, and for some time, the only symptom of a toxæmia.

When the patient returns about the twenty-eighth or thirtieth week, systematic palpation of the abdomen should be carried out, and the following points noted: The presentation and position of the child. The position and rate of the fœtal heart sounds. Whether or not the presenting part is over the brim of the pelvis. The presence of abnormal conditions, such as: hydramnios, multiple pregnancy, or tumours. To get some idea of the size of the child. This abdominal examination should be repeated about the thirty-sixth week in a primipara and the thirty-eighth week in a multipara, when any abnormality in presentation or position may be dealt with.

If at any time during pregnancy a patient complains of bleeding, a vaginal examination is im-

perative to determine if possible the source of the hæmorrhage, as one may have to deal with threatened abortion, ectopic gestation, miscarriage, a tumour, or hydatidiform mole, in the earlier months of pregnancy, or with accidental hæmorrhage or placenta prævia in the latter months. An early diagnosis of placenta prævia is very important as the sooner treatment is instituted the better chance one's patient has of life.

It is however in the toxæmias of pregnancy that prompt and efficient antenatal care has proved its value, and the first intimation that a pregnant woman is toxæmic, as evidenced by albumin appearing in the urine, with or without headaches and œdema, and rising blood pressure, is a solemn warning to the medical attendant that treatment is imperative, and should be begun without delay. That prompt and efficient antenatal treatment in these cases is of the greatest benefit is amply demonstrated at the Royal Maternity Hospital, Glasgow, where they have an antenatal clinic averaging one hundred new cases a week and two antenatal wards of sixteen beds each, these being practically always full. In these wards are gathered all the cases of abnormal pregnancy seen at the clinic, and many cases of albuminuria from outside points, and I know of no case admitted to those wards that went on to eclamptic seizures. However one does not have to go so far away to see the benefits of antenatal care, as the clinic at the Winnipeg General Hospital during the two and a half years it has been in existence can show results just as satisfactory, although naturally the number of cases seen each week is not nearly so large. Eclampsia, as anyone who has seen much of it can testify, is such an appalling condition and is responsible for such a high mortality among mothers and infants, that surely no amount of time or labour spent in saving even one patient from this dreaded condition could ever be regretted.

The delivery of a healthy living child without damage to the mother is a consummation of pregnancy devoutly to be wished, and for the medical attendant to be in a position to do his share towards bringing this about, it is necessary that he should have, by his antenatal observations of his patient, some idea as to what kind of a delivery he may expect, and if he has reason to expect any great difficulty, he should lay his plans before labour sets in. In the event of having to make a choice between induction of premature labour and Cæsarean section at the time of election, one must remember that induction before the thirty-seventh week does not hold out much hope for the production of a healthy living child, although one does know of many cases where infants have survived when born much earlier than that.

Definite rules can be laid down for the management of labour in contracted pelvis, according to the degree of contraction present, but two important factors enter into every case, neither of which can be estimated accurately; namely, the size of the child's head, which can only be estimated in relation to the pelvic brim by means of Muller's method, although use has been made of the x-ray to try to determine this; and the nature of the labour that any given patient may have. One has seen borderline cases where doubt existed as to whether or not the head would come through, in which by reason of the patient having a good labour, with hard strong pains, the child was born without much difficulty.

There is no doubt that a knowledge of the patient's pelvis, and of the position of the child will do much to lessen the necessity for forceps interference, an interference that is only too common and which very often results in injury to both mother and child. In managing a case of difficult labour due to disproportion between the child's head and the mother's pelvis, if there is any possibility of an elective Cæsarean section having to be done, and this must not be confused with Cæsarean section at the time of election, the strictest asepsis must be observed and delivery with forceps should not be attempted.

The best way of trying to ensure a healthy postnatal period for the mother, is by taking every precaution during labour to avoid carrying infection to one's patient. What asepsis has done for surgery it can do for midwifery, if given a chance, and in the conduct of labour, vaginal examinations should be avoided as much as possible, rectal examination giving just as much information regarding the progress of labour with the added advantage of being absolutely safe. Wise management of the third stage of labour is essential. One should not be too impatient to get the placenta away, and the reprehensible habit of massaging and kneading the uterus before the birth of the placenta cannot be too strongly condemned. By all means keep control of the fundus to see if there is any internal bleeding, but one should avoid interfering with the normal separation of the placenta if at all possible; forcible detachment and expression frequently means small pieces of placenta or membrane left inside with

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a tendency to postpartum hæmorrhage and very often with a consequent morbidity in the puerperium, or it may result in the placenta becoming detached from the margin and causing an alarming hæmorrhage, necessitating manual removal.

I am firmly convinced that much may be done to reduce morbidity in the puerperium by having one's patients adopt the upright posture early; there is no reason why a patient should not sit up in bed for short intervals on the second day, and sit up for her meals, and as much more as she feels like doing on the third day; this undoubtedly helps drainage very materially. Because a patient is allowed to sit up early is no reason for allowing her to get up from bed early, and I think the old maxim of waiting until the uterus again becomes a pelvic organ is a very good one.

A puerperal woman should never be discharged from treatment until a pelvic examination has been made to find out the condition of the organs. The best time for this is about six weeks after the birth of the baby. Retroversion following labour is fairly common and if discovered at this time is usually easily rectified; if necessary a pessary may be used to hold up the fundus for a time, the patient being told to report again in two months, or sooner if she has any pain, as sometimes the fundus retroverts over the pessary.

The importance of postnatal care was very aptly described by the late Dr. J. W. Ballantyne in an article in the *British Medical Journal*, of April, 1923. He said that postnatal care was very important, as after all it was the very beginning of antenatal care of a future pregnancy.

Many infants unfortunately die shortly after birth, and it is part of the obstetrician's duty to do what he can to save the child after he has safely delivered it. One has seen cases where no pretence was made to wait until the cord stopped pulsating before cutting it; by doing this one may deprive an infant of one or two ounces of blood, that in a weakly child might be just enough to turn the scale in its favour. Lack of asepsis in caring for the cord after it is severed is the cause of many infant deaths. Prophylactic treatment of the eyes should always be practiced irrespective of the social position of one's patients; it cannot possibly harm the child, and if the eyes of only one child were to be saved, surely that would be worth the slight extra trouble involved. One should do one's best to ensure the baby being breast fed, unless in the presence of some organic disease such as tuberculosis, when breast feeding is injudicious both for mother and child. In short, everything should be done that is possible to teach the mother so to raise her baby as to ensure a healthy happy infancy.

In conclusion I would say this: That every woman when she engages her medical attendant for her confinement has the right to expect, nay to demand, the best antenatal care to which our present day knowledge entitles her, and to demand that everything possible will be done to safeguard her own life and health, and the life and health of her unborn child.

The Etiology of Warts.—E. V. Ullmann, (*Acta Oto-Laryngologica*, vol. v, Fasc. 3, 1923, p. 317) inoculated his arm and also the vagina of a dog with an extract of a papilloma taken from the larynx of a 6-year-old boy. In both cases papillomatous growths developed at the site of inoculation several weeks later. The child from whose larynx the papilloma was removed was slightly wounded in the upper lip during the process, and about three and a half months later several small flat warts appeared on the upper lip, spreading thence to the rest of the face. It was noteworthy that though the inoculating medium was a papilloma, the appearance of the secondary growths varied with the site of inoculation. The author removed some of the growth on his arm and inoculated a medical friend, on whose arm a rapidly growing papilloma developed. The incubation period was barely five weeks—considerably shorter than the author's own case. The facts that the period of incubation was shortened and the rate of growth increased by human passage suggest that these growths are due to an infectious inflammatory disease. The author has also succeeded in cultivating growths on his skin after it had been inoculated with an extract of papilloma which had passed through a filter, and he submits that the laryngeal papilloma, which is closely allied to skin warts, should be regarded as the product of an ultra-microscopic, filter-passing virus.

TREATMENT OF ABORTION*

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THE proper treatment of abortion depends upon a detailed diagnosis. The records of the hospital show that occasionally a patient with a diagnosis of abortion has been taken to the operating room, and the ultimate diagnosis has proven the existence of a uterine or cervical polyp, or a carcinoma of the uterine body or cervix. Therefore, when approaching a case of abortion the first thing to decide is, does a pregnancy exist? If this question is answered in the affirmative, it is necessary to decide whether you are dealing with a pregnancy that is intra-uterine or extra-uterine. The symptoms of an intra-uterine abortion are a period of amenorrhœa and a period of bleeding and pain; the symptoms of a tubal abortion are a period of amenorrhœa and a period of bleeding and pain; and the differential diagnosis between these two is at times only made by a microscopical examination of the expelled uterine content, or by watching day by day the formation of an extra-uterine pelvic mass.

If the diagnosis is an intra-uterine pregnancy, you then must decide whether you are dealing with a threatened or an inevitable abortion. The signs and symptoms of an inevitable abortion are pain, hæmorrhage, and a dilating or a dilated cervix, any two of which may exist and the abortion be only threatened. It would then seem advisable on the first visit to decide whether it is to be treated as a threatened abortion, or whether it is already inevitable. This can usually be done by examination of the cervix uteri, without any disturbance of the patient or aggravation of the condition. The threatened abortion is treated by mental and physical rest for a period of ten days after the bleeding has ceased. If the abortion is inevitable and some extrusion has taken place, you then must answer the question as to whether it is complete or incomplete. The diagnosis of the complete abortion is made only by an examination of the expelled content, and if the gestation sac is complete the patient is kept in bed for a period of ten days. If, on the other hand, it is decided that it is an incomplete abortion, you then ask yourself two more questions, viz., are you dealing with an infected abortion or a non-infected. If a non-infected incomplete abortion, the treatment depends upon whether the cervix is closed or open. If closed, the cervix and vagina should be tightly packed with gauze and ½ cc. pituitrin given every four hours. The packing is removed at the end of twelve hours, and the probability is that the gestation sac will be found in the vagina, or the cervix dilated to admit the passage of a finger. If, on the other hand, the cervix is found to be open the patient should be given an anæsthetic, and the remaining pieces of placenta gently loosened by the finger and removed with an ovum forceps. The uterus is washed out with some antiseptic solution, and a strip of iodoform gauze is inserted, and left in place for a period of twelve to twenty-four hours. You will note that no curettage is recommended.

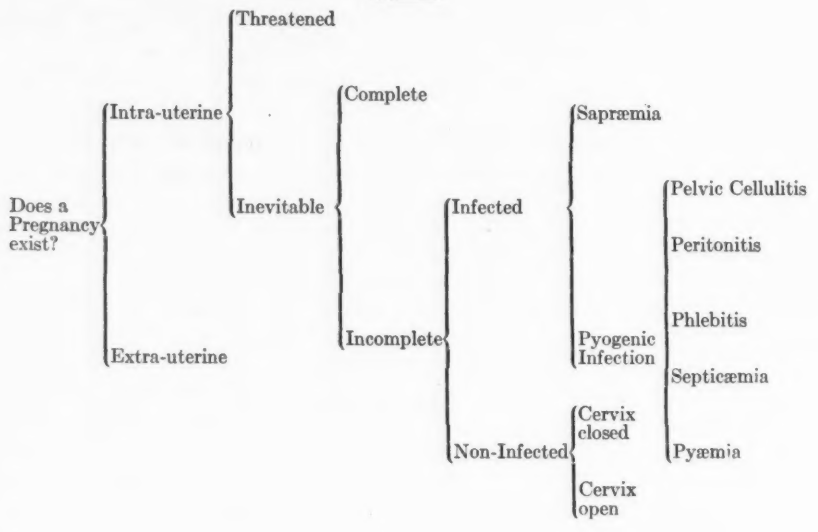
If, however, the diagnosis is an infected, incomplete abortion, you ask yourselves two more questions, viz., whether you are dealing with a so-called sapræmia, or a spreading pyogenic infection. If a sapræmia, the separation of the necrotic placenta by the examining finger, and its removal with the ovum forceps will still give the best results; but with a pyogenic spreading infection, interference is absolutely contra-indicated. The diagnosis between these two is most essential.

The patient suffering with a sapræmia will have a moderate rise in temperature and in pulse rate. The tongue will be moist, and there will be no abdominal tenderness. There is usually a foul-smelling vaginal discharge, and the cervix is open and the uterus enlarged but not tender. The patient with a pyogenic spreading infection will have a much higher temperature, a more rapid pulse rate, and is usually abnormally bright. There is some abdominal tenderness. There is a vaginal discharge; the uterus is tender on pressure and on movement, possibly a mass developing alongside of it may be felt. The proper treat-

From a symposium on the work at the Montreal Maternity Hospital reported to the Montreal Medico-Chirurgical Society, May 2nd, 1924.

ment of a case of this nature is along constitutional lines, with injection of anti-streptococcus serum, and careful watching for the various avenues that the infection may travel.

SCHEME



ANÆSTHESIA IN OBSTETRICS*

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IN the relief of pain in obstetrical practice it is obviously necessary that such drugs and methods be employed as will interfere as little as possible with the normal physiological progress of labour. We believe that latterly much has been acomplished which deserves general application.

At the Montreal Maternity Hospital the anæsthetic and analgesic agents used are heroin, chloroform, ether, methylene chloride and nitrous oxide; it may be seen at once that we are conservative; we think advisedly so. We intend to use ethylene as soon as it can be obtained, for we have seen it successfully employed elsewhere and are convinced that this gas has a definite place in obstetrics. We have not employed "twilight sleep" for a long time. As far as spinal, regional and colonic anæsthesias are concerned we believe it advisable to wait for a more general acceptance of these methods.

During the first stage of labour in healthy individuals heroin is given hypodermically in small doses; with the onset of the second stage analgesia is produced usually with chloroform, the concentration being increased sufficiently to cause complete anæsthesia for the termination of this stage. In a certain number of cases methylene chloride has been used in place of chloroform to produce analgesia; methylene chloride is one of the chlorine substitution products of methane (CH_2Cl_2) and when used for analgesia it does not interfere with muscular efforts. Ether is not used in normal labour for although it is pharmacologically much less harmful than chloroform, in the clinic it is found that its desired effect is not produced rapidly enough, and again, unless it is applied expertly salivation and mucous formation may be so great as to cause serious obstruction in the airway and may result in cyanosis. Ether is only used in our routine work for the operative procedures and then only postpartum.

Generally speaking, some of us believe that

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the agent of choice in obstetrics is nitrous oxide and for the following reasons: It has been definitely established that this agent is the least harmful of all the known anæsthetics; it does not cause the muscles to relax; it produces analgesia or anæsthesia very rapidly; in analgesia it removes the fear of pain and consequently the uterine contractions are aided by voluntary fixation of the abdominal muscles and bearing down efforts; and with it an abundance of oxygen may be administered, even to a greater degree than would be possible if the patient breathed the air of an ordinary room. This is accomplished by increasing the pressures of the nitrous oxide and oxygen. For these reasons it has been found that nitrous oxide can be safely commenced earlier in labour than any other anæsthetic agent, and the period of parturition is shortened. A few words of warning concerning the use of nitrous oxide should be added. *It is necessary to avoid cyanosis!* Now in order to obtain satisfactory results with this gas it must be administered at increased pressure, which calls for a closed and practically air tight system existing between the respiratory apparatus and the supply of the gas. This, therefore, shuts off the possibility of obtaining oxygen from the air, hence the only manner by which the subject can be provided with sufficient oxygen is by adding it to the nitrous oxide on the inside of the closed system; as a matter of fact this can be done with perfect accuracy, and the percentages of the two gases may be varied momentarily. One other cause of cyanosis is obstruction at some point in the upper respiratory tract, usually due to spasm, particularly of the vocal cords; this rarely occurs and may be overcome by the administration of pure oxygen under pressure. It ought to be a comparatively simple matter to offset these difficulties by careful supervision.

In administering nitrous oxide for the operative procedures of obstetrics it is occasionally found advisable to mix a small amount of ether vapour with the gases for a few minutes, to obtain sufficient relaxation. The small amounts of ether used in this manner have never, in our experience, been harmful.

Ether and chloroform cause always marked concentration of the blood, easily prevented by water or hypo-tonic solutions administered by any means. This blood concentration is due to diminution of plasma volume. When morphine has been previously administered blood concentration is not nearly so marked. Although hyperglycæmia of ether or chloroform has been long known, we have found that its degree is greater with chloroform than with ether and greater still when morphine is used beforehand. This disturbance in glucose metabolism would seem to contra-indicate the administration of sugar solutions before, during or immediately after anæsthesia. Lastly, as the temperature of the subject is always lowered in anæsthesia at ordinary environmental conditions and as we have found that it can be maintained at its normal level by moderately increasing the environmental temperature, it would seem advisable that steps be taken in the same direction for operations on the human subject.

The Value of Camphor-in-oil as a Cardiac Stimulant.—Because present opinions with regard to the effect of camphor on the cardiovascular system are contradictory, and because of the widespread use of the drug as an "emergency stimulant," H. M. Marvin and J. D. Soifer, New Haven, Conn., made an attempt to determine its action in patients with heart failure. Fourteen patients with advanced congestive heart failure and two normal persons were given intramuscular injections of camphor-in-oil in repeated small doses and single large doses, the total amount varying between 0.6 gm. (9 grains) and 3 gm. (45 grains). Frequent observations were made to determine its effect on the cardiovascular system. No evidence was obtained that camphor in such dosage had any action whatever on the heart rate, respiration, blood pressure, vital capacity, electrocardiogram, or general clinical condition of the patient. The subsequent administration of digitalis resulted, in ten of twelve patients, in prompt and definite improvement. Therefore, the authors feel that camphor has no demonstrable action on the circulation in congestive heart failure, and therefore has no rational place in the treatment of that condition.—*Jour. Am. Med. Ass.*, July 12, 1924.

SOME CONCLUSIONS AFTER A SYMPOSIUM IN OBSTETRICS*

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THE total number of confinements during the past year in the Montreal Maternity were:

In the In-door Service.....	1,354
In the Out-door Service.....	379
Total.....	1,733 cases

Of this total, 1,536 patients delivered themselves spontaneously; and only 197 required assistance. This assistance took the form of forceps extraction in 172 cases, and a version and extraction in twenty-five cases. This mechanical assistance in the 197 cases represents a percentage of interference of 11.5. This is not so far from the general statement that ninety per cent of all deliveries are spontaneous, provided they are wisely left to themselves. It is true that within these figures are not included fifteen cases of Cæsarean section, but as an offset to this, it is to be remembered that in hospital we deal with the abnormal and the complicated cases. I may mention here that in the extern service there were 379 deliveries, and only two of these required assistance; in these two the forceps were applied. May I add that in the 172 cases of forceps delivery, only five of these were the so-called "high forceps" (where the bi-parietal diameter of the head is above the level of the ischial spines). Four of these children were dead-born, and two of the mothers experienced a morbid puerperium. The moral of this is—do not apply "high forceps", save under the urgent necessity of severe maternal distress. Until the head reaches the perineum, a child in distress is often better relieved by one-twelfth of heroin, given hypodermically to the mother, than by a forceps delivery.

We conclude from these results that labour is a physiological process, if the woman is but let alone. The ideal labour—the one safest for the mother and the child, remains still the labour that is spontaneous. And it is this ideal that we are to aim at. This maternal function may not safely be either disregarded or usurped. Hence, the routine abrogation of the second stage by version and extraction; or by the use of so-called "prophylactic forceps"; the "vicarious labour" of the obstetrician is a practice unsafe and to be condemned.

And this is my first conclusion. "Wisdom is justified of her children", as we see in the following results. In the 1,733 cases, we lost but seven mothers: a mortality rate of 0.4%. The morbidity percentage in the puerperium, measured by the high standard of a single rise of temperature during the stay in hospital to 100.6° was 21.2 per cent. And this is a thoroughly good result. The infantile results were also satisfactory. We lost but twenty-one babies, dying intrapartum from the trauma of labour; and but eight full-term babies, who died post-partum. Accordingly we conclude that, for both the mother and the child, the year 1923 in the Montreal Maternity Hospital may be classified as fortunate and satisfactory.

Of the maternal deaths (seven) two died from sepsis, three from toxæmia (the eclamptic type), and one from hæmorrhage in a placenta prævia. One case succumbed to pernicious vomiting when she was four and one-half months pregnant. It may be stated that during the past few years eclampsia has outrun sepsis as a cause of maternal death. Formerly, as you know, they ranked as about equal in this mortality—a fifty-fifty causation. Of late years the proportion is roughly thirty to twenty, as against the toxæmia. Eclamptic toxæmia is a frequent cause of maternal death, and this brings us to our second conclusion: *A woman who has suffered in one pregnancy from an eclampsia, should, in any subsequent pregnancy spend the last trimester largely in bed;* and this irrespective of all chemical findings, or non-findings, in the urine or blood.

Hæmorrhage associated with labour is now much more seldom seen, for the reason that the labour is more skilfully handled. In the past year, we had but one death from hæmorrhage. Post-partum hæmorrhage is practically a thing of the past, for we never hurry the third stage. We are all agreed that post-partum hæmorrhage

*From a symposium on the work at the Montreal Maternity Hospital reported to the Montreal Medico-Chirurgical Society, May 2nd, 1924.

is more often the fault of the too-impatient physician than of the too-patient uterus. One's eye must be kept off the clock, for the uterus is the only trustworthy timepiece. The third stage is a miniature labour, which follows, at a longer or shorter interval of uterine rest, the more strenuous labour concerned in the expulsion of the child. Let the placenta wait for this uterine recovery, until it manifest this recovery by regular and strong contractions.

There were seventeen cases of placenta prævia, and three of these were central. As I have said, one mother succumbed, and we lost four of the children. These cases were characterized by the onset of painless uterine hæmorrhage during the last trimester, and our experience in these cases ratifies a third conclusion: *Given such a uterine hæmorrhage, and the diagnosis of placenta prævia made, either central or marginal, the sooner delivery is effected the better.* Successive hæmorrhages tend to increase in severity, and assistance even in hospital is not always immediate. May I add that a firm vaginal pack of sterile gauze, a scultetus binder, and one-sixth of morphia hypodermically, will control the hæmorrhage, and give the physician time to secure assistance, or to remove the patient to hospital.

In the pernicious vomiting of pregnancy, where the patient, despite all treatment remains toxic, do not wait too long before interrupting the pregnancy. If the pulse-rate rise steadily to 100, and continue thereat for twenty-four hours, it is wise to empty the uterus. And this rule is a fourth conclusion. *In the treatment of these toxic cases, 200 cc. of a 20% glucose solution may be given intravenously, two or even three times in the twenty-four hours, often with marked benefit.* Th employment of insulin in these cases is still merely theoretical.

Pregnancy and labour are the supreme tests of a woman's fitness, physically, mentally, and morally. And this maternal fitness is the true measure of a nation's place, a true measure of its survival. Pregnancy and lactation are, in a strict sense, a test of maternal metabolism; while the labour is not only a trial of her physical fitness, but also of her *morale.* We will arrive nowhere by merely attempting to abrogate, to take away this test of labour; for the result will be but the perpetuation of an increasing decrepitude. While excessive pain is always to be relieved (such pain is a damaging thing and brings no compensation) the neuro-muscular function itself is to be preserved. Accordingly, the wise way, and the only way, is to train the woman for the preservation of this function, to train her mentally, morally, and physically in his natal athletics. This maternal function represents for her the inevitable, the inescapable, struggle in her fitness to survive. Prophylaxis then, is the word—prophylaxis, or preparation of the girl during her childhood and adolescence (unostentatious preparation, I mean) so that she may successfully accomplish the task that she has been sent into this world to perform. It will generally be admitted, I think, that we must reform to some considerable extent our ways of living: reform the life of the indolent and luxurious rich, and reform the conditions of the underfed and over-worked poor.

And this is the final conclusion.

Stomatitis Following the Injection of Mercurochrome-220 Soluble in a Tuberculous Sinus. — In a case cited by Chester C. Guy, Chicago, discharging sinuses in the region of the greater trochanter communicated, through the acetabulum, with an abscess cavity in the pelvis on the inner surface of the ilium. March 22, 15 c.c. of a 1 per cent. solution of mercurochrome-220 soluble was injected into the sinuses after irrigation with physiologic sodium chlorid solution. This was repeated daily, and a marked decrease in the amount of the discharge was noted. Improvement continued until April 10, when the patient began to complain of soreness in the gums, profuse salivation, loosening of teeth, and diarrhoea. These symptoms increased rapidly in severity, and the next day the injections were stopped. Two weeks later, the stomatitis and diarrhoea had entirely disappeared, and they have not recurred since.—*Jour. Am. Med. Ass.,* June 28, 1924.

INTRACARDIAC ADRENALIN IN ASPHYXIA NEONATORUM

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THE following cases are reported, not to bring forward any new method of treatment, but merely to draw attention to the successful application of a therapeutic measure, at present seldom used, but which has proved of value in apparently hopeless cases of asphyxia neonatorum. After following our patients through a stormy pregnancy and a severely prolonged labour, we naturally prefer presenting the tired mother with her hard earned offspring crying lustily rather than the unpleasant task of informing her that she has passed through nine months of at least indifferent health, and several hours of agony, which, as obstetricians, we personally would dread facing, with no reward and with more or less permanent damage to her well being.

Both mothers were elderly primipara, having possibly, their only chance of motherhood; both had had a stormy pregnancy and a severe labour: both were presented with living children, although the first died later from other contributary causes.

Case 1.—Baby E. (Patient of Dr. A. H. Rondeau). The mother was a primipara, 35 years of age. Her pregnancy had been normal up to eight months gestation, when her blood pressure suddenly rose in three days from 130 to 210 mm. Hg., and a sudden uncontrollable onset of eclampsia took place, in spite of most energetic treatment. In consultation with Dr. Rondeau, we decided on a Cæsarian section, on account of the frequency of the seizures, a generally contracted flat pelvis, her primiparity, a long rigid cervix and the baby apparently in good condition. We delivered a four and a half pound child on which all ordinary methods of resuscitation completely failed. Three minims of adrenalin solution was then injected directly into the left ventricle. Cardiac response was almost immediate and active respiration began a few seconds later. The baby was returned to the nursery in fair condition considering its prematurity and took feedings normally for thirty-six hours before dying suddenly. The pathologist reported finding the typical fatty degeneration of the liver, kidneys, spleen, etc., found in toxæmic cases, and gave as the probable cause of death toxæmia and prematurity.

Case 2.—Baby R. The mother was a primipara 41 years of age and married twenty years. Pregnancy was moderately normal, but her labour lasted three days with extremely severe pains during the last twelve hours. On account of the poor fœtal condition I terminated labour by an easy mid-forcep extraction and delivered a perfectly white nine and a half pound child, on which all methods of resuscitation again met with absolutely no response for at least twenty minutes. I then injected 4 min. of adrenalin solution, as in Case 1, with immediate cardiac response but only a slow, although permanent onset of respiration. When I left the home the young daughter was loudly protesting against her first bath. She gave no further trouble and is now eleven months old and weighs twenty-two pounds. The asphyxiated condition in this case I believe, was due to overdosage (to the mother) of mor phine and scop lamine.

Physiological Action of Adrenalin Chloride.—According to standard authorities on pharmacology and therapeutics, adrenalin, injected into the blood stream, stimulates the myoneural junctions of the post-ganglionic fibres of the sympathetic nerves, in contradistinction to nicotine, which acts directly on the ganglionic cells. The most marked affect is seen on the circulatory system, the action being directly on the myoneural junctions in the heart and arterial musculature. After injection, intracardial or intravenously, a marked rise in blood pressure is produced, with a corresponding acceleration in the heart action. This rise of blood pressure is mostly due to constriction of the splanchnic vascular system. The initial effect is generally followed by a temporary slowing of the heart and a fall in pressure.

Cushney[1] explains this action by demonstrating the simultaneous action of adrenalin on both the vaso-constrictor and vaso-dilator mechanisms, with the vaso-constrictor stimulation generally much more marked both as to duration and degree of action; consequently the vaso-dilator affect is more than counterbalanced. According to this author, after paralyzing the vaso-constrictor mechanism with ergotoxin, administration of adrenalin given intravenously invariably produces a fall

in blood pressure. Cushney also claims that large doses may cause excessive heart acceleration and prevent complete relaxation during diastole, with a consequent decreased functional output and fall of blood pressure. This acceleration may actually be increased to a persistent cardiac fibrillary contraction.

The effect on the coronary arteries is generally one of vaso-dilatation and as a consequence we have an increased blood supply to the cardiac musculature, although Brodie and Cullen claim that doses of small concentration cause a distinct vaso-constriction of the coronary vessels. Another possible effect of large dosage is actual inhibition of heart action from excitation of the vagus centre. Cushney says this is purely secondary to cerebral congestion and irritability of the vagus centre from the initial marked rise of blood pressure.

The physiological action on the respiratory apparatus also gives a warning against overdosage and the site of the intracardial injection. Administered intravenously, or directly applied to lung tissue, it has practically no vaso-constrictor effect. However, by action on the myoneural sympathetic element, it does cause relaxation of the bronchial muscles and, therefore, overdosage may produce actual œdema of the lungs with a cardiac vagal inhibition.

In the newborn, intravenous injection is hardly practical: intramuscular injection is too slow of action in the presence of embarrassed circulation: therefore, intracardiac injection is, of necessity, the method of choice. G. W. Crile,[2] in his paper on "Cerebral Anæmia and Resuscitation", claims that after marked anæmia of the cerebral centre for more than ten minutes, recovery is impossible. This possibly explains many of the unsuccessful cases reported. We must remember, however, that we are dealing with extremely desperate cases, where other methods of resuscitation have failed, and on this account, it is not the percentage of unsuccessful results but the percentage of successful results alone with which we are concerned.

Historical.—Intracardiac injection of adrenalin is by no means new. It was first recommended by Winter,[3] in 1905, as a prompt heart stimulant in cases of narcotism. A few years later, in 1909, the subject was discussed by Latzko[4] at the Medical Congress of Vienna with reports on several cases. In 1910, Läwen and Sievers[5] of the Trendelenberg Clinic, carried out comparative experiments on animals with adrenalin and strophanthin. They preferred adrenalin, and secured results by its use after all other methods had failed, even direct heart massage. During the war, Szubinsky[6] tried it and digipuratum on the battlefield, but did not secure a successful result as all his cases were apparently hopeless in any event. Professor Von. d. Velden[7], reports forty-five cases treated by intracardiac injections of adrenalin, strophanthin, digifolin, digipuratum, caffeine or camphor. He secured no permanent recoveries but selects adrenalin as the drug of pre-eminent value. Guthman[8] reports two cases with recovery, one after acute chloroform poisoning, and a second of extreme post-operative shock following laparotomy for a ruptured ectopic gestation, after all other methods had completely failed. Hesse[9] found no hæmorrhage from puncture of the left ventricle, but in one of four cases, where the right ventricle had been punctured, he found 20 cc. of blood in the pericardial sac. C. Bodin[10] collected reports on ninety cases with twenty-four complete recoveries. More recently papers have been published by several authors. G. Kneier[11] recommends its use in acute paralysis of the heart when other methods have failed and places the time limit at three minutes after cessation of respiration. He reports two cases with one recovery. Dacharry[12] gives the only reports I can find of its use in asphyxia neonatorum. He injected 5 mm. into the left ventricle in five cases, after severe instrumental delivery, with one recovery, but the child died nine days later from traumatic meningeal hæmorrhage. P. B. Champlin[13] reports one successful case in collapse during a second stage prostatectomy under 0.5% procain caudal anæsthesia. He used 10 cc. (1-10,000 solution) into the left ventricle. D. W. Crile[14] reports five cases with two recoveries using 10 cc. dosage into the left ventricle. He advises left ventricular injections so as to prevent the pulmonary circulation receiving adrenalized blood directly before dilution, apparently respecting the action of the drug on the bronchial musculature.

Bodin collected ninety cases with twenty-four recoveries, although several of the twenty-four died later from other contributary causes. To this number I have added nine cases from the literature, not included in his report, with five recoveries (the more favourable results probably due to earlier use of the remedy) and two cases of my own, making a total of 101 cases with thirty-one successful results or approximately thirty-one per cent. In this group are seven cases of asphyxia neonatorum with four recoveries, or

approximately fifty-five per cent. All cases had failed to respond to other methods of treatment and would undoubtedly have died otherwise. Any treatment giving from thirty to fifty-five per cent results in such extreme cases should not be relegated to a position of "last resort."

The following conclusions may be drawn:

(1) Intracardiac injections of adrenalin is a rational and practical therapeutic measure in cases of asphyxia neonatorum.

(2) It is not necessary in ordinary cases, but should be at least available when occasion demands its use.

(3) The exact intracardiac dosage is, as yet, a matter of dispute.

(4) The left ventricular wall is the most desirable site of injection.

(5) The dangers are more theoretical than practical and in cases where it is necessary the "end justifies the means" even if some element of danger is entailed.

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Roentgen-Ray Therapy of Poliomyelitis.—In summarizing the effects of roentgen rays and radioactive substances on the living cell, it appears logical to Herman B. Philips and Walter I. Galland, New York, to conclude that roentgen-ray or radium irradiation might offer a singularly efficient and easily applied method of stimulating the diseased anterior horn cells of the cord in cases of poliomyelitis. By actually stimulating metabolism in the cells and adjoining tissues, definite relief of profoundly disturbing symptoms, as well as improvement in the paralysis, has been secured. The author have studied the effects of irradiation in two distinct phases of poliomyelitis, namely: 1. In the residual paralysis in patients who, under the usual therapy, have ceased to show improvement in muscular power. Three patients with severe paralysis, each of whom were irradiated, had failed to respond to the usual physical therapeutic measures. These patients all showed improvement following a series of irradiations of the spinal segment. One of these patients had had total paralysis of both lower extremities for more than a year, and exhibited some activity in muscles on both sides after having received four irradiations. The other two patients showed improvement, although perhaps less striking than in the case cited. The authors emphasize the fact that, apart from slight manifestations of roentgen sickness, none of these patients exhibited any deleterious effects on the neuromuscular system. Up to the present time, it would appear that the treatment is without danger when properly controlled. 2. In the hyperesthetic cases following the acute phase of the disease. Four patients exhibiting marked persistent hyperesthesia were irradiated with extremely encouraging results. All of these patients showed marked improvement within a week after the first irradiation of the involved spinal segments. It is therefore concluded that: Roentgen-ray therapy offers a method of shortening the period of hyperesthesia following the acute stage of poliomyelitis. Roentgen-ray therapy offers a method of shortening the period of hyperesthesia following the acute stage of poliomyelitis. Roentgen-ray therapy offers a singularly safe and easily applied method of stimulating diseased but viable anterior horn cells in poliomyelitis in the stationary stage.—*Jour. Am. Med. Ass.*, June 7, 1924.

Owing to the insanitary conditions connected with the earthquake there has been a great increase this year in the number of cases of dysentery and typhoid fever in Tokyo.

MODERN TENDENCIES IN INFANT FEEDING*

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LIKE everything else in medicine, our ideas and practices with regard to the feeding of healthy and sick infants have constantly been undergoing progressive changes. The past ten years have been notable for the numerous attempts to elucidate the perplexing question of athrepsia, and present indications would lead us to believe that we are perhaps now on the verge of a better understanding of the reasons for the failure of many infants to thrive on ordinary modifications of cow's milk. It is perhaps just because investigation along these lines has not yet been entirely successful, and because we still are forced to resort to human milk as a means of helping us out of our feeding difficulties, that the importance of the preservation of the supply of milk in nursing mothers is still the most important problem in infant feeding to-day. Whatever we may have learnt in recent years concerning the artificial feeding of infants, has detracted nothing from the paramount importance of keeping them at the breast for as long a period as possible. This is in a sense an admission of defeat, but it is better so, than to begin to feel that science is able now to adequately nourish all infants by artificial means, and that breast feeding can be dispensed with entirely.

The outstanding modern tendency in infant feeding is therefore what we might term the "back to nature" movement. I believe that the greatest credit for impressing both physicians and the laity with this fact is due to Dr. Truby King, of New Zealand, and to the late Dr. Sedgewick, of Minneapolis.

The work of both these men has been to show how it is possible to increase a failing milk supply and to re-establish the milk even a month or two after an infant has been weaned, by using very simple and easily applied methods, such as nursing both breasts, emptying the breasts after each nursing, and stimulating the breasts by alternate hot and cold applications. That it is comparatively easy to bring back the milk so long as there is any secretion in the breasts at all, has many times been demonstrated in practice. A single instance will serve as an illustration.

An infant ten months of age was weaned at the age of nine months on the advice of the family physician. He had always refused up to the time of weaning to take anything except the breast, and for this reason the weaning was done suddenly. The infant persistently refused food, lost weight, developed severe acidosis, and soon became dangerously ill. Four weeks after the weaning, his diet consisted of Bovril, water, and a few teaspoonfuls of Allenbury's food. He was emaciated, had a strong acetone breath and looked extremely toxic. The mother's breasts were flabby, but contained a small amount of secretion. The infant was put to the breast regularly every four hours, and was given small rectal salines and dextrose solution subcutaneously. In three days the breasts were moderately tense and the infant was considerably better. After complete recovery from the acidosis and the effects of starvation the infant was again weaned and fed by gavage until he gradually came around to taking food himself.

Here is an instance, then, in which the breast milk was fully re-established one month after an infant had been weaned. One frequently sees infants in office and hospital practice who have been weaned for two or three weeks or even longer, who are successfully put back upon the breast, the breast feeding being complemented if necessary with an artificial mixture. In my own experience I have succeeded in putting back to the breast and in re-establishing the milk supply where the infant had been weaned for a little over twelve weeks. Similar results can readily be obtained by anyone. It should be a matter of general knowledge that milk persists in the breasts for many weeks after even vigorous efforts to drive it away, and that it can quickly be re-established almost fully by very simple methods.

When we come to consider our present attitude towards artificial feeding, we are struck by the obvious trend towards simplicity which is taking the place of the so-called "percentage

*Read before the Pædiatric Section of the Annual Meeting of the Canadian Medical Association at Ottawa, June 19th., 1924.

methods" and other methods of only a few years ago. We all remember working out formulas on paper, to the second decimal place, and then proceeding to make up such a formula with a milk of varying daily composition, blissfully believing that the mixture was exactly as the percentage formula indicated, and that the infant would become ill if the various ingredients of the mixture varied within one half of one per cent of its supposed composition. The percentage idea doubtless originated in the early efforts to modify cow's milk so as to make it resemble human milk in composition. The idea being, of course, that the differences in the amounts of protein, sugar and salts between the two milks were responsible for the indigestibility of cow's milk. The modern tendency is rather to so treat cow's milk as to make infants thrive on it, regardless of whether it resembles human milk in composition or not. This is the proper attitude, of course, and it leads us to feeding mixtures which would have made Rotch gape with astonishment; yet none can deny that we are nearer to solving some of the complex problems of athrepsia today than we were in Rotch's time.

We have gradually come to a realization of this simple fact—that the important thing in the feeding of infants is to feed them food which is digestible and which meets all their needs regardless of how it differs from human milk, and that by no amount of modification of cow's milk can it in any way, in the present state of our knowledge, be made exactly like human milk.

Most pædiatrists will agree that in the great majority of under-nourished infants who come to them, the one thing that has rarely been considered in the previous feeding is the infant's particular requirements. Feedings are often prescribed according to age rather than according to weight, and of the two, the latter requires the greater consideration. Whatever the food prescribed, and whatever the percentage composition, no food is adequate that does not amply fulfil the energy requirements of the child. Nothing is simpler than calculating the caloric value of a mixture, and yet it is rarely done; nothing is easier than calculating the food requirements of a given infant and comparing them with the value of the proposed food, and yet this important step is often ignored. However great the tendency toward simplification in matters of infant feeding may become, the importance of giving food on the basis of requirements can never be minimized, and no system of feeding can succeed without these considerations being uppermost.

In preparing any food for an infant, we must see to it that the caloric value of the food yields about forty-five calories per pound of body weight and that sufficient milk is given to cover the protein requirements of the infant. The protein requirements are covered when the milk is about one and a half ounces per pound of body weight per twenty-four hours, or about one-tenth of the body weight of the infant. The difference in calories is made up with a suitable carbohydrate and water or gruel is added to supply the infant's demands for bulk and for water. The addition of cream also enhances the caloric value of a mixture, but this practice is not without danger except in very vigorous infants, and if used at all, should be used with caution.

In our own times, we have seen each of the various elements of cow's milk bear the brunt of the blame for the digestive disorders of infancy. It was first the protein that was held responsible, because it presents the greatest obvious differences in composition between human and cow's milk. This led to the well known and nearly obsolete "split protein" or whey and cream method of infant feeding. The attempt being to so alter the protein of cow's milk that it presented approximately the same relations between lactalbumin and casein that does human milk. It was and is a good method, and is still very useful in certain cases, but the benefits derived from it are probably not due to the alteration in the proportions of casein and lactalbumin, but to something else which I shall mention presently. Sugars next came in for their share of the blame, and following Finkelstein's lead we were all ready to accuse the carbohydrates of the cow's milk of responsibility in causing all intestinal and digestive disturbances of infants. This gave way to the fats, whereupon homogenization and substitution of other fats tended for a while to become a vogue. It is only natural that now we should blame the salts or fall behind in the march of progress. Water only is left, and it probably will form the basis of an elaborate theory in the near future.

The evidence with regard to the rôle of the salts and other buffer substances of cow's milk in the etiology of athrepsia has been crystallized and emphasized by Marriott in his recent work. It has been shown long ago by Clark, in his work on hydrogen-ion concentration that cow's milk contains buffer substances in much higher con-

centration than they are present in human milk, and in virtue of this fact, cow's milk, while more acid than human milk, is less acid really because of the power it possesses of binding about three times more acid than human milk. The buffer substances in cow's milk are the phosphates and the calcium caseinate. Of the total buffer substances present, approximately one-third, Marriott says, exists in the whey, and the remaining two-thirds in the curds. Marriott believes that for this reason, cow's milk when ingested, binds a considerable proportion of the hydrochloric acid of the gastric juice, thus neutralizing it and prevents the gastric contents from becoming nearly so acid as is the case with breast milk. This causes the stomach to empty more slowly, the bactericidal action of the gastric juice is lost, and the stimulus to bile and pancreatic secretion is impaired if not lost entirely. To remedy this he has suggested the acidification of cow's milk with sufficient acid to make the hydrogen-ion concentration of the food similar to that of breast milk. This was first done by fermenting the milk with acid producing organisms, but when it was shown that the benefits from lactic acid milk were due to the lactic acid itself rather than to the bacteria, the fermenting of milk gave way to the mere addition of lactic acid itself in suitable quantities. The addition of about one drachm of lactic acid to a pint of whole milk will give a hydrogen-ion concentration similar to that of human milk. Such milk is well tolerated and perfectly digested even by very young and feeble infants who thrive well on it if suitable amounts of carbohydrate are added.

More recently Faber has attempted to raise the hydrogen-ion concentration of cow's milk by the addition of tenth normal hydrochloric acid with equally good results, and finally Hess and Matzner have suggested the use of lemon juice and egg yolk; their idea being to supply the milk with the necessary antiscorbutic and antirachitic vitamins at the same time. Their reports too are equally encouraging.

And here we come to the probable explanation of why whey and cream mixtures worked out so well in the days when they were the vogue. The answer probably is that in the manufacture of the whey, sufficient salts and curd are eliminated to materially reduce the buffer value of the mixture, thus allowing a fuller and more complete gastric digestion, without so great a quantity of the gastric hydrochloric acid being neutralized.

And so the pendulum has swung. Ten years ago we were adding alkalis to milk as the only and proper way to feed infants successfully, our idea then being mainly to produce a fine curd in the stomach. Now we are adding acid to milk in order to neutralize buffer substances. While the first flush of our enthusiasm may lead us to believe that now at last we have solved the vexed problem of difficult feeding, the future only can tell to what extent these theories and observations are correct.

Our present day simplicity in matters of infant feeding has perhaps made us forget a great deal about the value of different types of carbohydrates as additions to milk mixtures. Many teach that cane sugar and corn syrup are the only two carbohydrates which require consideration. We must not forget that lactose, dextri-maltose, and malt soup all have their uses and their indications. It is sometimes desirable to give sugars with higher or lower concentration of dextrin and of maltose; there are times when any malt at all is contraindicated and times too when cane sugar is not well tolerated. There are advantages at times in using more than one sugar in prescribing a mixture, and when varying amounts of starch are indicated. These facts must not be lost sight of if we are to be successful in the greatest number of our feeding cases.

Morse, only three or four years ago, in an article exceptional for its conservatism, wrote that at one year of age an infant should receive little more than milk, bread, and a little cereal. This represents the very antithesis of the modern tendency in the feeding of infants. It is certainly of advantage to begin solid foods before the infant becomes so old that he begins to prefer his bottle to any other form of feeding. The time when an infant begins to carry everything within his reach to his mouth is the opportune time to develop in him a taste for foods other than milk. Ordinarily one prescribes at this time some cereal, a little stale bread, some spinach or other green vegetable, and perhaps some broth. It is true that many infants can get on without these additions, but apart from other considerations, what makes them particularly necessary at this time is the extreme difficulty in getting the infant to take them later on if they have not been begun in some measure at the earlier time. Despite the teaching of Morse, the modern trend is far more radical. I remember Holt successfully prescribing two hard boiled and grated eggs per day to an infant of six months who was recovering from a severe intestinal upset and who had an intolerance for

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cow's milk in any but minute quantities. We have all heard of thick cereal feeding in certain cases of vomiting in infants of any age, no matter how young, and this would lead us to wonder whether one could not as a routine prescribe cereals considerably before six months. Eggs have generally been considered too difficult of digestion until ten or twelve months of age. Schlossmann withheld eggs and meat until the third year—this was in 1908. Now we find Hess advising the addition of yolk of egg to the milk of infants as early as six weeks of age, and apparently with impunity. During this past winter, I have many times prescribed the yolk of an egg in the food mixture of infants of any age, no matter how young—who were unable to tolerate cod liver oil, and I have made it a common practice recently to prescribe yolk of egg at six months and have never seen the slightest untoward result from this. Abt, in Chicago, gives bacon at six months as a routine. These practices are very much at variance with the teaching of ס'ץ a few years ago, yet they have proven quite satisfactory. I had recently under my care a young infant suffering from severe rumination. He was five months old when first seen and was fed successfully on thick cereal. He was very pale, was unable to take orange or tomato juice or cod liver oil in any quantity. This difficulty was overcome by cooking into his thick food mixture a whole potato and the yolks of two eggs, among other things. He tolerated these foods very well and thrived on them despite his tender age.

These experiences would lead us to doubt the necessity for an extreme conservatism in the matter of feeding solid food—certainly from the age of six months and onwards and in special cases even before this age.

When it comes to feeding difficult cases, rules and practices must at times be discarded, and must give way to a broad empiricism. Feedings must sometimes be highly concentrated, and unusual articles of diet must at times be used before a successful result can be obtained, but all these practices, unusual as they may seem, and empirical as they sometimes are, must be supported by the skill and experience of the physician who has handled great numbers of such cases.

I have tried in my very poor way to give a very brief outline indeed of the trend of modern pædiatrics in the matter of feeding young infants. Much has been reclaimed from the ranks of empiricism to those of scientific exactness, but much still remains empirical and must needs remain so until further scientific work shall have set our feet on firmer ground. The greatest advance in infant feeding is, I believe, the work of Marriott who has taught us the value and significance of the acidification of milk, but the problem will only be solved when a food shall have been devised which like human milk will invariably agree with all infants, and which will not require alteration in its composition throughout the bottle period of the infant's life.

Artificial Light Therapy in Tuberculosis.—Under the influence of light, the blood in rickets shows an increased phosphorus content, and calcium deposition in the epiphyses of the long bones readily takes place. The blood in tetany shows an increased calcium and phosphorus content and, clinically, the disappearance of such symptoms as carpopedal spasms, laryngospasms and convulsions after a few exposures to quartz mercury vapor radiations. Lupus vulgaris of the skin is healed by combined local and general light exposures in almost 90 per cent. of cases. Extrapulmonary tuberculosis in many forms yields to treatment with sunlight and artificial light radiations. These results have been so clear cut in a large number of cases and yield so much promise that Edgar Mayer, Saranac Lake, N. Y., feels that a knowledge of light and its clinical applications has become a requisite not only of the physiotherapist, but also of the general practitioner. He reviews his experience during six years and discusses physical ultraviolet rays on protoplasm; the physio- of separate regions of the spectrum; action of vultraviolet rays on protoplasm; the physiologic action of light; the skin as an organ; and quartz mercury vapour and carbon arc lights. Brief reference is made to the use of light, more especially the mercury quartz, in intestinal tuberculosis; hilum tuberculosis; superficial tuberculosis and lupus vulgaris.—*Jour. Am. Med. Ass.*, June 14, 1924.

THE USE OF ACID MILK MIXTURES IN INFANT FEEDING*

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THE use of acidified milk as a food for young infants began in Holland, where "butter-milk", a by-product of the dairy industry, was given to sick babies, with signal success. From Holland its use spread into Germany, where, in adapting it to use as a food for babies, flour and cane sugar were added. Since butter is made from milk soured by a great variety of acid-producing organisms, it soon offended the sensibilities of bacteriologists, who recommended that milk be sterilized by boiling, and then inoculated by some innocuous acid-producing organism. Also butter-milk is essentially a "fat free" milk, and as fat free milk is not always desirable, whole milk artificially soured came to be used and spoken of as "acidified milk". In North America during recent years acidified cow's milk has come into increasingly common use in every baby hospital and dispensary, and has displayed its usefulness as a food for babies with nutritional disturbances to such an extent, that, in some quarters it is considered the next best thing to breast milk.

The use of acidified milk is indicated for practically any young baby with a disturbance of its nutrition for whom it is impossible to get breast milk, excepting of course, those showing an idiosyncrasy to cow's milk. In particular I mean any artificially fed baby who refuses to gain weight, and has attacks of vomiting, distension, and diarrhœa, when fed on any sweet cow's milk mixture or any of the numerous prepared baby foods which flood the market. Such an infant will usually do well on acidified milk. Particularly is it of value in the treatment of those unfortunate babies whose nutrition has suffered so severely that they have gone on to that disorder known as "marasmus". The great difficulty here is to find a food that the baby can digest at all, and having one, to get it of sufficient "strength", that is caloric value, to cover the needs of the child. Acidified milk can be fed to these infants in much stronger mixtures than can sweet milk, and much larger amounts of sugar can be added to it, without producing diarrhœa or vomiting. This is due, so far as we know, to the acid in the milk. Nor is its use limited to the feeding of sick babies, it can be fed successfully to well babies. I know of a Foundling Hospital in the city of Cleveland, where infants are cared for from the age of two weeks on, and where there is but one standard feeding for all, namely, acidified whole milk with added sugar, an ounce to the pint; all the babies take it and apparently do well.

There are in all four recognized methods of preparing acidified milk. Three lend themselves particularly to hospital practice, and the fourth lends itself with equal facility to hospital, dispensary, and private practice, and is being used extensively by us in Montreal. The first, and for many years the only method used, was the sterilization of sweet milk by boiling. This was then inoculated by a culture of *B. bulgaricus*, and allowed to stand at room temperature for twelve hours until it was well "clabbered" or clotted. This produced a sour milk having a large soft creamy curd, which was then broken up by beating with an egg-beater, and fed as required. This appears a simple operation. As a matter of experience there are several objections to its use in the average home. First'y, the bother and lack of care on the part of the mother; secondly, the bacillus culture becomes in time too strong, which results in the production of too much acid and the separation of the milk into curds and whey, rendering it unfit for an infant's food; and thirdly, failure to allow it to stand long enough, or in a warm enough place, will fail to produce sufficient acid, and the desired result is not attained.

This Bulgarian bacillus milk, or lactic acid milk, is produced commercially by some dairies in the larger cities of the United States, and sold at twenty-five to thirty cents per quart, which is fairly expensive. A similar product is made by the inoculation of the milk with a different organism, *B. acidolphus*. We have used this form of acidified milk with equally good results. It is now being supplied by various medical supply houses, particularly for the use of adults in whom it is desired to change the intestinal bacterial flora. The work of Chaplin and Rettger at Yale

*Read before the Annual Meeting, Canadian Medical Association, Ottawa, June, 1924.

has demonstrated the beneficial effect of this organism in certain diseased states. Herter showed that the *Bacillus bulgaricus* was unable to establish itself as an inhabitant below the ileocæcal valve, whereas *Bacillus bcidophilus* can be recovered from any part of the large intestine after administration by mouth for a few days.

A third method has recently been described by Faber from the University of California. He found that the addition of twenty-five per cent by volume of decinormal hydrochloric acid produced the desired effect of making the milk more readily digested by the baby. It has the disadvantage of increasing the volume without increasing the caloric value of the mixture. Moreover this mineral acid must be excreted as it is not oxidized like lactic acid.

The fourth and simplest method has been set forth by Marriott, of St. Louis, during the past twelve months. It is by the use of commercial lactic acid (80-85 per cent pure) which can be purchased from any chemical supply house. The method is this:—the milk is sterilized by boiling for three minutes over a low flame, stirring constantly, and is then allowed to cool. Lactic acid is then added, drop by drop from a dropper or pipette, while the milk is stirred with a spoon. The amount required to produce the proper degree of acidity is four drops of acid per ounce of milk. By this simple procedure a very satisfactory acidified milk is produced. The curd is smaller and less soft, and the milk does not have that thick, rich, creamy appearance produced by the bacterial inoculation method, and tastes perhaps a little more tart, although it produces equally satisfactory results on the baby. This ready method of preparation and the almost boundless possibility of its application as a food for artificially fed babies brings acidified milk within the field of use of all physicians having to deal with infants in private practice. The acid milk has a further advantage, the food as prepared is sterilized by boiling, that is, it is free from live organisms which would multiply on the food being allowed to stand, and possibly produce toxic substances which when ingested produce vomiting and diarrhœa. Further the addition of lactic acid as described inhibits the growth of organisms which may accidentally gain access to the milk while it is standing, after the mother has made up the twenty-four hour feeding. This means that the feeding may be kept for twenty-four hours without refrigeration if no ice is available, if care be exercised to prevent gross contamination.

A few words about administration: although acidified milk can be fed undiluted to most infants, even though sick, it is advisable at first to dilute it a little; one part water with two parts of milk, until the child becomes accustomed to the new food; then after a few days gradually reduce the amount of the diluent. Sugar can be added as required to make up the necessary food value, even in greater amounts than in the feeding of normal babies with sweet milk. In fact much larger amounts of sugar, up to two ounces in a twenty ounce mixture can be added gradually without the production of vomiting, diarrhœa, or flatus. We have occasionally used such mixtures containing eighteen per cent of carbohydrate with no untoward result.

There is usually no difficulty in getting babies under five or six months to take acidified milk. Occasionally one will refuse it for the first twelve or twenty-four hours, thereafter taking it greedily. However it is frequently difficult to get babies older than nine months to accept it, and only rarely after the first year will babies, who have not had it before, be induced to take it.

The principles involved in the use of acidified milk are these: firstly, that the gastric contents must attain a certain degree of acidity before digestion can proceed; secondly, that sweet cow's milk contains a large amount of alkaline or "buffer" substance which must be neutralized by the gastric hydrochloric acid before the optimum acidity is reached and digestion can proceed. It has been shown that three times as much acid is required to acidify a given quantity of cow's milk as it does to acidify an equal amount of breast milk. An undernourished child, or one suffering from some parenteral infection, is unable to produce sufficient gastric acid to produce this necessary acidity, so that digestion does not proceed normally, the child vomits and suffers from diarrhœa and loss of weight. The addition to the feeding of sufficient acid to neutralize the buffer substance of the sweet milk will often overcome these difficulties, and permit digestion to proceed in a normal orderly fashion.

In conclusion let me say that it is not claimed that acidified milk is a panacea for all nutritional disturbances of infancy, but when judiciously used it has proved to be another great advance in solving the difficult problem that is ever before the pædiatrist.

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CERTAIN FACTORS IN THE DIAGNOSIS OF SYPHILIS UNRECOGNIZED IN THE EARLIER YEARS OF THE INFECTION*

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THIS study is based on the records of 800 patients, examined in the Section on Dermatology and Syphilology of the Mayo Clinic and grouped as follows: (1) 756 patients investigated for evidence of syphilis when a definite diagnosis was impossible by ordinary examination, (2) 208 patients with absolutely untreated syphilis; (3) forty-seven patients with syphilis treated only by mouth, and (4) 178 patients with syphilis treated by mercurial inunctions, intramuscular injections, and a few injections of arsphenamin, not sufficient to constitute what is now accepted as effective treatment.

In this study three objects were kept in mind. First, to determine the efficiency of the "lues investigated" procedure, as employed in the section, consisting of the pooled medical resources of a group practice, with a special syphilological examination, including the provocative procedure, spinal fluid examination, detailed study of individual anamnesis, the family, and so forth. Second, to determine the significance of certain individual elements of the general examination, including the history, the Wassermann reaction and the spinal fluid examination, in the diagnosis of obscure or previously unrecognized syphilis. Third, to trace, so far as possible, what might be called the physiological course of obscure syphilis through a medical practice and to determine the status of the patient who, because of non-recognition of his disease, has been obliged to meet the situation without the aid of treatment. This point, which is, in a sense, an attempt to follow the natural history of the infection in the human subject, is dealt with in a separate communication.

The 756 patients subjected to special investigation in order to determine whether or not they had syphilis were relatively unpromising material. The grounds for detailed investigation included histories of infection of a suspicious character, symptoms which might be explained wholly or partly by a concealed syphilitic infection, and conditions for which there was no apparent explanation unless syphilis could be identified. It goes without saying that in none of these cases was syphilis recognized by any such simple device as a single positive blood Wassermann reaction. The procedures employed in the detection of syphilis in patients of this type constitute a group of twenty-two special examinations and investigations which have been reviewed elsewhere.

Even the unpromising material dealt with here yielded approximately 60 per cent. of positive results to this cooperative study. We believe that the elaborate investigative procedure which we have employed is thus justified as necessary to the decision of an expert regarding the question of whether or not syphilis is a factor in any given patient's medical problem.

The study relating to the anamnesis of obscure syphilis was stimulated by the statement in so notable a textbook as Osler's one volume work, editions up to 1918, "It is possible that the primary sore may have been of trifling extent, or urethral and masked by a gonorrhea, and the patient may not have had severe secondary symptoms, but such instances are extremely rare." It is only fair to say that in the later editions this statement has been painstakingly revised. If these impressions prevailed until so recent a date, in one of the most widely read textbooks in the hands of physicians and medical students now in practice, it is not surprising that we should be able to collect from a general diagnostic material so large a group of patients with syphilis unrecognized in the earlier years of the

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disease. The results of our study may be summarized as follows:

Of 255 patients with syphilis 41 per cent. were not aware of ever having had any venereal infection. At the time of their examination 52.5 per cent. did not know they had acquired syphilis; 27.5 per cent. could give histories only of a genital sore, and 10 per cent. of the total number could give only histories of secondaries. Incidentally "falling hair" was not accepted as an adequate history of secondaries.

The striking difference between the value of anamnesis in women with syphilis, as compared with men, is illustrated by the fact that in this group of unrecognized syphilitic infections, only 23 per cent. of women could give any historical detail that would aid in diagnosis, as compared with 81.6 per cent of men who could recall some contributing facts. In conducting these inquiries, careful thought was given to the veracity of patients, and it was obvious that in our clientele, at least, the patient, frankly approached with the statement that his replies might make or mar the entire diagnostic and therapeutic outcome of his case, seldom lied.

The unrecognizable pathway of infection in syphilis is an important diagnostic fact, as has been testified to several times in the course of surveys by our department. The masked or concealed onset of syphilis has had a revival of attention in recent French literature, and could advantageously have fuller consideration from the profession of our own country. The satellite bubo, in particular, as a guide in the detection of the onset of syphilis well deserves re-emphasis in the following quotation from Fournier, containing one of Ricord's most famous aphorisms: "'Faire la chasse aux ganglions, courir sus aux ganglions. Car l'adenopathie est pour le chancre l'effet qui suit la cause. En bien, remontez a la cause par l'effet; remontez au chancre par le bubon . . . Le bubon est le fil d'Ariane qui permet de retrouver la porte d'entrée de la verole'."

The case herewith reported is a fairly typical illustration of the obscure onset of syphilis, which accounts for the completely negative histories and the familiar "He denied venereal infection," in clinical notes:

Obscure syphilitic infection in the wife with negative examination of the husband, followed by a concealed primary lesion in the latter diagnosed only after a positive Wassermann reaction and clinical identification of the satellite adenopathy.

Mrs. X. entered the Clinic complaining of headache and aching all over the body. Examination disclosed signs of healed pulmonary tuberculosis, but otherwise was practically negative. The Wassermann reaction was positive. Examination by a good light disclosed a faint erythemato-squamous eruption especially on the forearms, which was regarded by several competent observers as dermatitis or toxic erythema. Under treatment for syphilis this eruption cleared up, partially disappeared, and then generalized into an acute postarsphenamin dermatitis. The possibility that the syphilis was latent and not in an acute secondary stage was then accepted, to be reversed later. Nevertheless the patient's husband was requested to come for examination.

Examination of Mr. X. disclosed a healthy young man without history or signs of venereal disease, and with blood Wassermann reaction negative on two repetitions. He was advised to have a third Wassermann test in one month. Six weeks later he came to the Clinic complaining of loss of weight, malaise, and swelling of the glands on the left side of the neck. General examination was negative. The Wassermann reaction, however, was now found to be strongly positive on two repetitions. On reëxamination nothing could be found except a slight general adenopathy and a rather more pronounced though not striking inguinal adenitis. On retracting the foreskin, however, the redundant skin on the shaft of the penis stood up in a pronounced ridge distinctly palpable as an infiltrated cord (dorsal or pipestem lymphangitis). Competent examiners had said that there was no sign of a genital lesion. The patient was questioned concerning difficulty in urination, which he denied. Nothing could be palpated along the course of the penile urethra. On careful examination of the meatus a slight reddening and pouting of the mesial lips, such as might be observed following the repeated passage of irritating urine, was detected. No significant induration could be recognized by palpation transversely to or longitudinally in the direction of the penile urethra.. Numerous *Spirocheta pallida* were found, after abrading the margins of the meatus and making a dark-field examination. The patient denied exposure except with his wife. The wife subsequently admitted exposure with a former paramour, some weeks before coming to the Clinic.

Discussion

This is a fairly typical illustration of the occult onset of syphilis which accounts for completely negative histories. The portal of entry was entirely overlooked by several competent men, and was only detected when the peculiar eruption presented by the wife, and the fact of the patient's developing a positive Wassermann following previous negatives, were taken into account. The secondary eruption in the wife was apparently masked by toxic erythema, although the exact age and status of her infection could not be established. The husband's primary lesion consisted of slight œdema and redness of the lips of the urinary meatus. The only clue to this as the primary lesion was afforded by the combination of moderate inguinal adenopathy with dorsal lymphangitis. The patient who was reasonably alert, had certainly not suspected that he had a primary lesion. Otherwise he would have sought medical advice.

The Wassermann Reaction in Untreated Syphilis

The reliance generally placed by physicians on the Wassermann reaction, makes these data regarding its limitations, even in untreated syphilis, of interest. Of 208 unrecognized and therefore absolutely untreated cases of syphilis in our series, 68.2 per cent. had positive Wassermann reactions. It is obvious, then, that the Wassermann test has a 30 per cent. margin of diagnostic error even in late untreated cases. This is practically identical with the estimate of 60 to 70 per cent. of positives made by Generich in a diagnostic practice in tabetics in the second decade of the disease.

Of forty-six patients who had received treatment by mouth earlier in the disease, 60.8 per cent. showed positive Wassermann reactions on the blood. Medication of this type, then, is evidently not an important factor in modifying the serological findings of later years. The effect of more intensive and more recent treatment in the later years of syphilis on its clinical diagnosis is well illustrated by the fact that in the general run of treated and untreated patients with syphilis seen in the Mayo Clinic, approximately only 45 per cent. have positive blood Wassermann reactions.

Proportion of Positive Blood Wassermann Reactions in Various Types of Untreated Syphilis

Clinical guides to the recognition of neurosyphilis are certainly much more numerous than in visceral, vascular, osseous, mucosal, and cutaneous aspects of the disease. For this reason one must expect a higher proportion of positive blood Wassermann reactions in the latter types as detected in clinical practice, and a lower proportion among neurosyphilitic patients, because in this type the Wassermann reaction is too often the only means of checking the diagnosis. The neurosyphilitic with a well developed process carries about him so many aids to diagnosis at the hands of a painstaking examiner, that a much larger proportion of this type of case is likely to be identified in spite of negative blood Wassermann reactions, than of any other type. Nevertheless, the difference disclosed in Table 1 between neurosyphilis and visceral, latent, cardiovascular, osseous, cutaneous, and mucosal syphilis seems too striking to be merely circumstantial in origin. In our experience the syphilitic patient with a negative Wassermann reaction on the blood is preeminently a neurosyphilitic.

TABLE 1

The Proportion of Positive Blood Wassermann Reactions Obtained in Various Types of Untreated Syphilitic Patients.

	Cases	*Positive*	*Per cent.*
Visceral syphilis	18	18	100.0
Latent syphilis	49	46	93.8
Cardiovascular syphilis	20	17	85.0
Osseous syphilis	19	16	84.2
Cutaneous syphilis	22	18	81.2
Mucous membrane syphilis	10	8	80.0
Neurosyphilis	114	47	41.2

By way of theoretical explanation of this difference it is conceivable that the reacting body in the positive blood Wassermann reaction is a product of some chemical phase of the syphilitic inflammatory process in certain tissues. In syphilis of the viscera, biochemical material for the Bordet-Gengou phenomenon may be released by the syphilitic reaction. In the nervous system, on the other hand, the material for producing the Wassermann body may be lacking before the reaction takes place, or the reaction may assume a different form from that in syphilis elsewhere in the body, with resultant failure to produce Wassermann reactions, and consequently a negative reaction in the blood.

The same tendency to blood Wassermann negativity in neurosyphilis seems to be verified in our cases from another standpoint. Of sixty patients with negative blood Wassermann reactions, 62.5 per cent. had abnormal spinal fluids. Of ninety patients with positive blood Wassermann reactions only 40 per cent. had abnormal fluids. Of the patients with positive blood Wassermann reactions, only 23 per cent. had positive

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Wassermann reactions on the spinal fluid, while of the patients with negative blood Wassermann reactions, 43.7 per cent. had positive Wassermann reactions on the spinal fluid. (Fig. 1). From the clinical standpoint, therefore, it is suggested that the syphilitic patient with negative blood Wassermann reaction is more likely to have an abnormal spinal fluid than is the patient whose blood Wassermann reaction is positive. Is it the lack of a defensive mechanism which expresses itself in the type of tissue reaction that gives rise to the positive blood Wassermann reaction, that endangers these patients' nervous systems? This question obviously cannot be answered on the evidence here available.

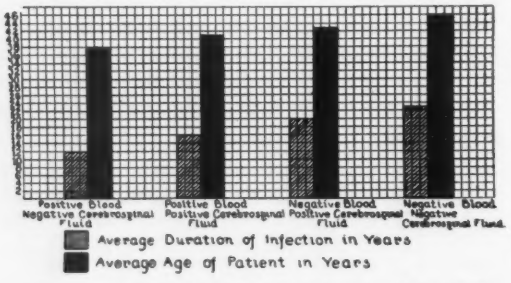
Positive Blood Negative Cerebrospinal Fluid
Positive Blood Positive Cerebrospinal Fluid
Negative Blood Positive Cerebrospinal Fluid
Negative Blood Negative Cerebrospinal Fluid
Average Duration of Infection in Years
Average Age of Patient in Years

FIG. 1.—The serological gradient in untreated syphilis. Note that the curve of duration of the infection in years and of age of the patient confirm each other, both showing the same increase in the proportion of serologically negative cases, with lapse of time.

SUMMARY

The history of a syphilitic infection is a notoriously unreliable guide to the presence of the disease.

Obscure onsets, unrecognized primary and secondary lesions, and even absence of clinical primary and secondary lesions as such, must be reckoned with in as high as 25 per cent. of the average diagnosed syphilis in medical consultant practice. In women the proportion is much higher. A complete medical and syphilological examination made to confirm or disprove a possibility of syphilis, has even from unpromising material, yielded 60 per cent. of positive results. This examination included the pooled resources of a group practice, plus a provocative procedure, the spinal fluid examination, detailed individual anamnesis, study of the family, and so forth.

The margin of syphilis which, even though *untreated*, is Wassermann negative in the blood by ordinary technique in a diagnostic practice, is about 30 per cent.

The margin of syphilis, diagnosed and undiagnosed, which is blood Wassermann negative in the average consultant practice may reach 55 per cent.

Neurosyphilis is the type which in our experience, shows a distinct tendency to Wassermann negativity in the blood, and hence calls for fuller testing by other means, especially the spinal fluid examination, to establish the diagnosis in the period of latency, when treatment may yet be of value. We realize that the greater clinical recognizability of neurosyphilis without the assistance of a positive blood Wassermann reaction, influences the validity of this conclusion.

Leprosy.—H. H. Holderman, Shenandoah, Pa., reports a sporadic case of leprosy developing at Shenandoah, Pa. The course of the disease in this case was characteristic of that described by most writers. The onset was insidious after a probable prolonged incubation period. There were visible macular leprosy of the hands; the tubercular or nodular leprosy of the face; the loss of the outer half of the eyebrow; the broadening of the nose; the thickening of the finger nails, or the beginning of the structural changes or the so-called lepra mutilans. In addition to the aphonia present, the patient had several severe asphyxiation attacks, due to an edema of the glottis and the laryngeal involvement. After these attacks, there was a very free flow of saliva, faintly blood tinged. There were no further laryngeal symptoms after the administration of the oil was started. Besides segregation and the usual hygienic treatment, the patient was given, by intramuscular injection, chaulmoogra oil in the dose of 0.5 c.c. weekly, and each dose was increased by 0.5 c.c. The treatment was continued until the maximum of 4 c.c. was reached. The treatment showed no results except an arrest in the laryngeal symptoms. There were no asphyxiation attacks nor any blood tinged saliva after the oil treatment was started. The oil seemed to act almost instantly on the laryngeal symptoms.—*Jour. Am. Med. Ass.*, June 14, 1924.

TRYPARSAMIDE

In General Paresis and Other Forms of Neurosyphilis

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HSOLOMON[1] in a recent article on the treatment of neurosyphilis before the introduction of tryparsamide emphasizes the fact that the central spinal fluid is more or less walled off from the rest of the body and that it is difficult for the molecules of the heavy metals such as arsenic to penetrate into it. "Some of the patients suffering from these conditions are never cured by treatment, some get well by treatment, some get well in spite of it, and some are actually hindered by treatment." He continues: Forty per cent of tabes and meningo-vascular syphilitics have a negative blood Wassermann, and, on the other hand, in some of even the well established cases there may be a negative Wassermann in the spinal fluid. In the stage of generalization of the infection the central nervous system is involved in a high percentage of cases, and even spirochætes have been isolated from the spinal fluid and the meninges within a very few months of the primary infection. However, in many of these cases the immunity reactions of the body and the central nervous system are sufficient to sterilize these reactions and no subsequent evidence of disease results. In some, however, it continues and in others it may recur. To illustrate the latter point he quotes the following case: "J. S., a man in the early twenties, developed a primary lesion; immediately underwent treatment, receiving six injections of arsphenamine and thirty of mercury. Six months after the appearance of the chancre, and while still under treatment, he developed a ptosis of the eyelid. A year later a hemiplegia developed. Fourteen intravenous injections of arsphenamine were given, but despite this the spinal fluid was positive." This is not an uncommon experience. In such cases as these, under treatment the blood Wassermann may become negative without any corresponding change in the spinal fluid indicating that in it the process is still active. He quotes another case, in which a man with strong evidence of general syphilis had it cleared up after six years of vigorous treatment, at which time symptoms of involvement of the central nervous system and of spinal fluid involvement first appeared.

After referring to some of the more vigorous attempts at approach to the central nervous system by means of injecting the spinal canal by lumbar puncture and even by cistern puncture, he draws the following conclusions:—that our antisyphilitic drugs are relatively unsatisfactory, even for cases of syphilis, not of the nervous system; that the central nervous system is walled off from the general body structure both as regards the spirochæte itself and the entrance of drugs from the blood stream into the nervous structure; that cases in which antisyphilitic drugs might be potent if they reached the spirochæte, receive no benefit from systemic treatment; that the central nervous system involvement may be increased rather than favourably influenced by such therapy.

Tryparsamide, so-called on account of its specific action in trypanosomiasis, was first synthesized in 1915 by Jacobs and Heidelberger in the course of a search for substitutes for arsenical products which the United States Army had some difficulty in obtaining at that time on account of the Great War. The biological action of this drug was first studied in the same year, by Brown and Pearce[2] with the result that it was selected from a mass of other substitutes because of its high value as a trypanocidal agent. By analogy it was applied as a spirochæticidal agent in the treatment of experimental syphilis. Its value in the latter sphere as compared with arsphenamin, neoarsphenamin, atoxyl, arsphenylglycin or even arsacetin particularly in early generalized cases of syphilis was rather moderate. In other words it was a poor spirochæticide. However, in the course of the experiments a number of other qualities was discovered, which speedily placed it upon a pedestal in certain forms of syphilis. The high degree of tolerance in regard to the size of dose and its repetition; its general lack of toxicity; the tendency of such toxicity to disappear on the withdrawal of the drug; its exceptional penetrability;

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its causing no local irritability at the point of administration; and its unusual tonic, alterative, or reinforcive action were noted. The value of this chemical was, however, limited to such cases where the foci of infection were difficult to get at by the more powerful spirochæticidal drugs—in other words, where the condition had reached a more or less resistant stage, as in involvement of the central nervous system, or in other foci in which the other drugs could reach only in a minimal degree. Besides its weak spirochæticidal power one other drawback was found in common with atoxyl and arsacetin, nam ly, a tendency to cause amblyopia.

So much for animal experimentation. In 1919 Louise Pearce, and later, Keidel and Moore carried out a number of experiments on human beings and found that the above qualities were manifested in human syphilis, with the added advantage that the misgivings in regard to the amblyopia though not altogether removed, were somewhat relieved. Sufficient experimentation had now been performed to establish the value of the drug as a comparatively non-toxic, highly penetrating, strongly reinforcing, therapeutic agent even though of limited parasiticidal power. The drug was now handed over by Wade H. Brown to the Wisconsin Psychopathic Institute for further investigation.

In the Wisconsin Psychopathic Institute Drs. Lorenz, Lowenhart, Blickwenn, and Hodges assisted by Drs. Kasek, Kenney, and A. K. Viner, after a preliminary course of laboratory work, treated a series of nearly one hundred cases. It was possible to follow up some of them for a year or two after the cessation or the diminution of treatment. These cases were divided into two classes; 1, those committed as insane, and 2, the ambulatory cases. The former clas consisted of forty-two late paretics, twelve early paretics, mostly of a fulminant type, viz., the kind that are associated with great excitement, rapid loss of weight, and death within a few months, two taboparetics, one tabetic, two meningovascular, and two generalized, syphilitics. In this series of sixty-one cases, thirty-four had been completely or tentatively discharged as arrested, and were earning their own living and ten had decidedly improved, leaving a balance of seventeen, all old paretics, unchanged. In other words, of a total of fifty-four in the paretic class alone—a class hitherto considered as practically hopeless—only seventeen remained unimproved. The criteria for judgment as to a patient's condition before, during and after treatment were mental, physical and serological and the improvement included all three subdivisions, though possibly least marked in the serological sphere.

In the ambulatory series which consisted of fourteen cases of paresis, three of taboparesis, four of tabes, eight of meningo-vascular syphilis, and seven of generalized syphilis or a total of thirty-six cases, there was arrest in thirty-three cases and improvement in the remaining three, and this again lay in the mental, physical, and serological spheres. To sum up this double series including sixty-eight paretics, five taboparetics, five tabetics, ten meningo-vascular syphilitics and nine generalized syphilitics, or a total of ninety-seven cases, there was arrest with return to work of sixty-seven cases, improvement in thirteen cases, and failure in seventeen of the forty-two old hospitalized paretics as already mentioned.

The only conclusion one could draw from such a series of statistics, assuming their correctness, was that at last a drug was available which might prove effective, especially if applied reasonably early, in depriving the insane asylums of ten to fifteen per cent of their potential inmates, to say nothing of remedying conditions among a fair percentage of the population, who might not necessarily have been committed.

We now come to the Johns Hopkins series under Moore, Robinson and Keidel.[4] After recounting the comparative inefficiency of tryparsamide in a number of early cases of syphilis including even early cases of neurosyphilis, they call attention to several differential points between the Wisconsin series and their own. Almost all of the latter were ambulatory and, generally speaking, in a less advanced stage. Most of them had already undergone prolonged and intensive antisyphilitic treatment, sometimes with recession of symptoms and physical signs, but almost without any serological change. Here tryparsamide had been tried as a last resort. Also there had been some variation in method from the Wisconsin group; they gave smaller doses of tryparsamide and alternated with mercury on a series with series rather than treatment with treatment basis. In spite of these differences in material and procedure the results were essentially in agreement with those of Lorenz and his co-workers. In short, they state that clinically and serologically they obtained better results from tryparsamide than from any previous method of treatment. There was one pecu-

liarity, however. Radical as their results were in all the elements of the cerebrospinal fluid, they generally found no diminution in the blood Wassermann and they try to account for it on the basis of their different procedure. Solomon last September at the Boston Psychopathic Institute informed me that he was in communication with Moore in regard to his results, and was amazed at the lack of change in the blood Wassermann of that group and that his own series of twenty-nine cases were showing very different results. I might add, while dealing with this point, that at the meeting of the Boston Society of Psychiatry and Neurology, on November 15th., Solomon, who by this time was treating seventy cases with tryparsamide, while declining to make any extended report, so early in his experience, stated that this drug does something in neurosyphilis that no other drug in their experience had done.

I may be permitted here to append the summary of Moore and his co-workers: "The place of tryparsamide in syphilotherapy has still to be defined. Our experience indicates its value in certain types of neurosyphilis and, in connection with the results of the Wisconsin workers, leads us to regard tryparsamide as a more effective drug than any other now at our disposal. In other forms of syphilis in which the nervous system is not involved we have seen no evidence of any value in the drug, except for its tonic effect in undernourished patients. It appears to be contra-indicated in early syphilis because of its feeble spirochæticidal power. In tertiary and latent syphilis our experience leads us to believe that it is inferior to the arsphenamins and that if used at all at this stage of the disease it should not replace the arsphenamins or mercury but only supplement them. For the present its use should be restricted to neurosyphilis and possibly to cardiovascular syphilis. It is suggested that the use of tryparsamide is to be avoided in all cases in which optic nerve impairment already exists, and it is recommended that during tryparsamide administration close attention be given to the fundus of the eye and to the sight."

The cases under my own care, on account of the limited quantity of tryparsamide available were few in number. One was a case of meningovascular syphilis, two were general paretics, one was a tabo-paretic; and one in the opinion of another specialist is tabes with an independent psychosis, but should, I think, be regarded as a tabo-paretic for reasons that I will state later.

Case 1. General paresis, male, 31 years. First seen December 24th., 1922, giving history of previous antiluetic treatment of ten intravenous injections ending a few months previously, at the last of which after having shown no improvement whatever he collapsed in the doctor's office. His physician refused to continue the treatments on account of their ineffectiveness.

On examination the patient showed general weakness, difficulty in standing or walking, tremor of hands, and tremor of lips, tongue and speech. Mental change was marked, the patient showed poor cerebration, with the contradictory phases of shyness, an attitude of depression, and decided euphoria. On January 1st., 1923, a lumbar puncture was done after a general neurological examination which showed nothing new except that the mental condition was rapidly deteriorating. The cerebrospinal fluid was typical of general paresis. The colloidal gold test showed the paretic curve, the Wassermann was + + + + with routine and reinforced antigen and there was a positive Noguchi, Ross-Jones, Pandy, and a cell count that was decidedly increased. Within a few days he was put on intravenous injections of three grammes of tryparsamide and intramuscular injections of one grain of a French preparation of gray oil. These treatments were given weekly for eight weeks and before the period was finished there was a marked improvement in his mental state, some improvement in his physical condition and some apparent gain in weight. A blood Wassermann now taken showed a 1 with the routine antigen and a 2+ with the reinforced antigen. After a rest period of six weeks, the course was repeated and resulted in a marked gain in weight, the complete disappearance of the physical symptoms, and an apparently complete restoration to a normal mental state with one possible exception. At the end of the second series lumbar puncture was done which caused an intense headache for two weeks. The cerebrospinal fluid showed marked improvement in all fields. On recent enquiry his fiancée informed me that he had been perfectly well since, that he was doing exceptionally well at his trade, and judging by some of his letters which she permitted me to read, his mind is quite clear. I have advised her to induce him to put himself under medical supervision.

Case 2. Meningovascular. O. DeM., woman, aged 32 years. Married 16 years. No miscarriages. No children. No precautions. Always apparently in good health. Lately suffering from

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perspiration, shivering and depression. Headache for past few weeks, history of double vision, also recent. Neurological examination negative except for Abadie's sign and slight external squint. Cerebrospinal fluid 3+ Wassermann, Noguchi, Pandy and Ross-Jones all positive. Cell count 32. Blood Wassermann 4+. Eight weekly injections of tryparsamide and mercury salicylate have resulted in a removal of the mental and physical signs, have reduced the spinal and blood Wassermann, and there is only a slight Noguchi left. The cell count is still 30. She is now on her second course and her condition remains as just stated.

Case 3. Taboparesis. I. M. S. Male, 42 years; divorced. No children. The first unstable symptom was his creating a disturbance in a street car, offering thousands of dollars to different people for various purposes. He was taken home by friends to save him from arrest as "drunk and disorderly". On the way home he accosted women and dashed through crowds in streets, using his head as a battering ram. A few days later his blood Wassermann was found to be 4+; he was too agitated to render lumbar puncture possible. A few days later again, neurological examination showed unequal irregular pupils, no reaction to light, loss of knee-jerks and Achilles reflexes, and comparative insensitiveness to pin-prick in ulnar distribution of hands. In addition there were ataxia of arms and legs, astereognosis, and rectal and vesical incontinence, from the rapid disappearance of the incontinence I am now inclined to attribute it to his mental rather than his physical condition. He received sixteen weekly combined treatments of tryparsamide and mercury salicylate without any rest period and made really remarkable progress. The mental signs cleared up very quickly. Within five weeks the man was practically normal and at the end of another week, was permitted to attend to his business. He has gained in weight eleven pounds. The tabetic symptoms have shown no change except that the knee jerks do not seem to be as dead as before. His blood Wassermann is still 4+. His cerebrospinal fluid has not yet been taken.

Case 4. Tabo-paresis or tabes + psychosis. Male, 41 years. Married 20 years. One child. Examined by Dr. F. H. Mackay, April 27th., 1923, who reports that patient will not speak, does not know where he is, thinks everyone about him is crazy, hears voices telling him to beware of crazy people; and is confused. He does not know the day or the month, and has been very irritable and sleepless for several months. He is very apprehensive and depressed. The pupils are dilated, equal and regular; there is no reaction to light; the knee jerks are gone. On admission to the Protestant Hospital for the Insane in June, 1923, he suffered from hallucinations and did not know where he was. He heard voices telling him to beware of the insane. There is a note to the effect that there were mental symptoms in other members of the family. After admission he continued in a more or less torpid or apathetic state. Beginning July 4th., 1923, he received eleven treatments of tryparsamide and mercury salicylate, receiving one of each weekly but on different days. On September 15th., he was allowed out for a month with marked physical and distinct mental improvement; he took more interest in his surroundings, was less depressed, and more talkative. He returned on November 7th., when I found him in good physical condition, easy to get along with, but still suffering from delusions, and had only one illusion and no hallucinations. After further treatments he has steadily improved until he has gained many pounds in weight, mentally is practically normal, and has good sight. Strange to say, though his knee jerks are still absent his pupils now react to light. The serological examination has shown little change. Wassermann 4+, a few cells, some globulin and the colloidal gold test made February 13th., was 0114430000—i.e., something between the tabetic and the meningovascular curve.

Case 5. R. D. Male, 38 years. Two children. Neurasthenic for about a year with complaints of depression and inability to concentrate; digestion impaired. When seen in May, 1923, talked and shouted day and night, and was extremely agitated but, excepting on one occasion when he struck his wife, he was not violent. Though coherent, he showed at times great exuberance of spirits and grandiose ideas. He also suffered from delusions of family persecution attributed to jealousy of himself. There were some hallucinations; he saw ghosts in the dark and heard people talk; and feared that poison had been put in his food. His habits were clean and he ate well but he had spells of starvation. Such was his condition on admission to the Protestant Hospital for the Insane at Verdun in July, 1923. Later on he became emotional, overactive and incoherent. It was very difficult to hold his attention and he was unable to execute the simp-

lest asks. His physical condition was rather poor. In May and June spinal fluid showed a positive Wassermann, with an increased cell count and a plus globulin. On July 30th. his Wasserman was 4+.

Beginning August 8th., 1923, he received a series of fifteen tryparsamide with alternating mercury salicylate injections ending on January 9th., 1924, with a rest period of six weeks about half way through. By December 21st., 1923, there was a marked general improvement in his condition, though he still suffered from ideas of persecution, and still entertained some grandiose ideas. Several examinations of his spinal fluid and his blood have demonstrated little if any serological improvement. When last seen he showed a remarkable improvement in his mental state; it took hard searching to detect any aberration from the normal. In addition there was a decided physical improvement. Cases 4 and 5 are in a condition in which thy may be allowed to return to their respective occupations, but subject to further observation and treatment.

Summary

While the small number of these cases and the lack of full and systematic serological study, together with the minimal improvement noted in the spinal fluid quite prevent the drawing of too positive conclusions, nevertheless it is claimed that in four and possibly in all five, the usual termination of the disease would have been continued insanity and death within a few years, whereas by the use of this remedy they have been restored for the time being at least to a state of apparently normal mentality, and to a good physical condition and show a marked gain in weight. In one case at least we believe we have seen an Argyll-Robertson pupil restored to normal. Finally in regard to the risk of optic atrophy much emphasized by all other observers I can only say that with frequent and careful questioning and repeated fundus examinations I have not yet been able to obtain any subjective or objective indications of optic nerve involvement. The only conclusion to be drawn from all this is that tryparsamide is a most valuable drug in the treatment of late neurosyphilis, a field hitherto regarded as almost hopeless.

NOTE—Since this paper was written cases No. 4. and No. 5. after several more injections have been discharged at least tentatively from the Protestant Hospital for the Insane as mentally normal.

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The Use in Sterility of Antispasmodic Drugs.—There is a definite group of sterile women through whose tubes gas can be passed with difficulty, or only after several attempts, or not at all, although the tubes are not sealed by adhesions, and are anatomically normal. The factor that prevents the passage of the gas in such cases is probably spasm of the sphincter-like circular muscle of the interstitial portion of the tube. The same factor can presumably prevent the entrance of spermatozoa into the tube, and so cause sterility. For the recognition of these, Samuel R. Meaker, Boston, proposes the following test: A first insufflation is done without preliminary medication. If no gas can be made to pass through the tubes, or if gas passes only when the pressure has been raised to 150 mm. or more of mercury, a second insufflation is done a day or so later after the administration of benzyl benzoate. If, on the second occasion, gas passes through tubes previously impermeable, or if it passes at a pressure of less than 100 mm. of mercury in cases in which a high pressure was previously required, we can consider that an obstructive degree of spasm of the tubal musculature has been demonstrated as a factor in the case. When it is shown by this test that a patient belongs to the group under discussion, and there is nothing else at fault with the wife or husband, then the administration of antispasmodic drugs post coitum is indicated for the treatment of sterility and should give good results.—*Jour. Am. Med. Ass.*, June 28, 1924.

THE MANAGEMENT OF THE NEUROSYPHILITIC*

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NEUROSYPHILIS is a disease of such multiform manifestations that its clinical symptomatology invades the field of every department and specialty of the practice of medicine and a knowledge of the factors concerned in its therapy is as necessary to the internist, the surgeon, or the ophthalmologist as it is to the neurologist. A complete résumé of a disease of such multiplicity cannot be attempted in a paper such as this but it is thought desirable to call attention to a few practical considerations in connection with its diagnosis and treatment, approaching the subject from two aspects, i.e. the management of a case of syphilis in relation to the nervous system and the management of the clinical neurosyphilitic.

It is probable that every case of syphilis suffers from an invasion of the neuraxis at some time during the course of the disease, usually within the first few months. As syphilis has become generalized before the primary lesion appears it is not remarkable that the *Treponemata pallida* have been demonstrated in the cerebrospinal fluid in cases in which the chancre was the only clinical sign, and it is very likely that the organisms are present in every early case. The presence of the treponemata does not mean necessarily infection but rather infestation, as many fluids in which the organisms have been demonstrated are negative serologically, and their numbers are not sufficient usually to produce a reactive inflammation on the part of the host until the period of clinical generalization is reached. Consequently, though about eight per cent of primary cases show a pathological cerebrospinal fluid, in the secondary stage the percentage rises to over fifty. As the disease in untreated cases progresses this percentage decreases to less than forty during the periods of late syphilis and clinical latency. As only about eight per cent of cases of syphilis develop clinical neurosyphilis it is apparent that the antibodies produced by the host are sufficient, in the majority of untreated cases to eradicate the organisms present in the central nervous system before gross injury occurs. Proof of this is found in the fact that marked secondary mucocutaneous lesions (which call forth large numbers of antibodies) seldom show a positive cerebrospinal fluid or are followed later by neurosyphilis, that over fifty per cent of intelligent neurosyphilitics are totally ignorant of having contracted syphilis, and that, in experimental animals, extirpation of the site of inoculation, even before clinical signs appear, or suppression of the disease by inadequate treatment, results later on, in a more severe type of the disease than in untreated subjects, and sometimes in infection of the nervous system, a condition rare in animal syphilis.

Any interference with the antibody production of the host results in an increased liability to neurosyphilis. In untreated cases the factor that suppresses resistance is unknown. The existence of a special neurotropic strain of organism has received no unqualified proof as yet, and it seems unnecessary to invoke this theory to explain why one untreated case develops neuro-involvement and another does not; rather does it seem that the defence of the host is at fault. Considering that there is a fairly definite ratio between the number of cases of untreated syphilis and of neurosyphilis, it would be expected, that, with the greater number of syphilitics now undergoing treatment, the number of neurosyphilitics would be decreasing. The general consensus of opinion is that such is not the case; that though syphilis itself is decreasing slightly, the number of neurosyphilitic cases is increasing and this increase is greater than can be accounted for by greater precision in diagnosis, and is too marked and of too recent occurrence to be attributed to the complexity of our civilization and its proneness to the production of nervous disorders. It seems necessary therefore to search for the etiological factor elsewhere than in either the host or the organism.

Cases of early syphilis to-day are treated usually with arsphenamine and mercury. Arsphenamine is known now to have no direct neurotropic action, but the spectacular manner in which it destroys the *Treponemata pallida* in the blood and contiguous tissues has one detrimental effect. By the elimination of the easily accessible

*Read before the Ottawa Medico-Chirurgical Society.

organisms the stimulus to the host's antibody formation disappears, and if an amount of the drug inadequate to reach and destroy every organism in the body is administered, the remaining foci are allowed to proliferate unchecked by the host's resistance, and serious late lesions of syphilis, particularly in the nervous system, result. Of interest in this connection is the recent report of McArthur[1] that in Bechuanaland, where syphilis affects a very large percentage of the population, neurosyphilis was unknown until treatment with arsphenamine was introduced. As the manner of life of the natives has not changed, and as the relative resistance to the disease is high, in that miscarriage or infant mortality from syphilis is infrequent despite the fact that both parents usually are syphilized, it would seem that treatment must be incriminated; the more so when it is understood that seldom are more than three injections of arsphenamine possible in any one case, owing to the carelessness and inaccessibility of the native patient. Mercury alone has not this rapid action and permits antibodies to continue to be formed while the drug itself is destroying slowly the infecting organisms.

It may be taken for granted that the increased incidence of syphilis of the central nervous system is due to the frequency with which a totally inadequate dosage of arsphenamine is administered to early cases. Great emphasis is being laid to-day on the necessity for commencing treatment before clinical generalization takes place, and if possible before the blood Wassermann reaction becomes positive, but it would be better from the standpoint of the nervous system to wait till the secondary stage is at its height, if an inadequate amount of treatment is not administered. The important fact to bear in mind in the treatment of early syphilis is that the nervous system must be protected at all costs and sufficient treatment given over a proper period of time to eradicate absolutely every organism. (To accomplish this mercury is as essential as arsphenamine.) With this end in view it is advisable to give every case of Wassermann-negative primary syphilis between twenty and twenty-five injections of arsphenamine, with a total dosage of from 12.0 to 15.0 grams of neo-arsphenamine or 8.0 to 10.0 grams of arsphenamine, and between seventy-five and one hundred weekly injections of mercury, the whole treatment covering a period of two years; for Wassermann-positive primary syphilis, an extra six months' course of treatment is necessary; for early generalized syphilis a course covering three years, comprising about thirty injections of arsphenamine and a corresponding increased amount of mercury. In these courses no single rest interval should be longer than a month and potassium iodide in moderate doses should be given during the time when mercury alone is being used. Were such a course followed in every early case neurosyphilis would become rapidly a rarity. To give a patient six to to eight injections of arsphenamine and a few months' mercury or to treat him only till his blood Wassermann reaction becomes negative is to expose him to a later neuro-involvement, frequently of the degenerative myelo-encephalitic type.

In treating a case of neurosyphilis it must be remembered that there is also an infection of the other organs present and the therapeutic endeavour should be to rid the host of all the *Treponemata pallida* wherever situated, paying particular attention, of course, to the infection in the neuraxis. Systemic treatment with arsphenamine intravenously and mercury intramuscularly should be carried on, using the more specialized forms of treatment only as adjuvants to enable therapy to act more directly on the nervous system. Routine treatment alone seems unable to control the neuro-infection in the majority of cases of definite neurosyphilis, and this applies equally to treatment with arsphenamine, mercury or bismuth. A new arsenical compound for intravenous use in late and neurosyphilis, the results of which seem very encouraging, has recently been reported by Lorenz and others[2]. This is tryparsamide and is used in 3.0 to 5.0 grams doses in conjunction with intramuscular mercury. Its action is only weakly spirocheticidal and it is valueless in the treatment of early syphilis but has much greater powers of penetrating the intrathecal spaces than arsphenamine and appears to act by stimulating the immune reactions of the patient. Unfortunately it has a trophic action on the optic nerve and therefore has to be used with great care. It is not yet on the market but if further reports bear out the statements made regarding its efficiency, it should be a valuable aid in combatting neurosyphilis.

There are two adjuvant methods of treatment, both of which aim at bringing the spirocheticidal agent in closer contact with the organisms infecting the central nervous system than can be done by ordinary intravenous associated with intramuscular injections, i.e., spinal drainage, either by the open or closed method, and the intraspinal

injection of either arsphenamine or arsphenamized serum. Spinal drainage by the open method consists in the withdrawal of 30 to 40 cc. of spinal fluid by lumbar puncture, an hour after the intravenous injection of arsphenamine. By this method the intrathecal pressure is thought to be lowered to the point where more of the arsphenamine circulating in the blood will be drawn into the tissues of the neuraxis, than ordinarily occurs. For this form of treatment the patient must be hospitalized and remain recumbent for thirty-six hours after the withdrawal, with the foot of the bed higher than the head. If indicated, it should be used not oftener than twice a month. Unfortunately it is not as efficacious in practice as it theoretically was thought might prove, and its greatest sphere of usefulness is as a preliminary to intraspinal injections in cases of degenerative myelitis. It accustoms the spinal cord to the trauma of intraspinal medication and particularly in tabes several drainages should precede intraspinal injections, otherwise the first injection may be followed by serious reactions, such as paraplegia.

The intravenous injection of 100 cc. of 15% saline solution produces a marked reduction in intrathecal pressure, even to the point where a negative pressure is present in the cerebrospinal spaces. A negative pressure is caused also in the perineuronic spaces, and the absorption of fluid to counteract this, draws from the blood or the cerebrospinal fluid any medication that may be there, and brings it into close contact with the cellular elements of the nervous system. In using this method 100 cc. of 15% saline is given intravenously, and a few hours later, preferably within three or four, an intravenous injection of arsphenamine is administered. One disadvantage of this type of treatment is that it is impracticable in elderly people, or in nephritics or arteriosclerotics, but in suitable cases it seems a distinct aid to either intravenous or intraspinal injections.

The direct introduction of arsphenamine into the intrathecal space may be accomplished by two methods. By the first a lumbar puncture is made, sufficient fluid removed for laboratory examination and then about 10 cc. of cerebrospinal fluid is allowed to flow into a glass cylinder. To this is added the requisite dose of arsphenamine (0.1 to 0.4 mg.) the whole thoroughly mixed and reinjected by gravity. Following this treatment the patient should remain in bed, for at least twelve hours, with his feet slightly higher than his head. If this is done there is little or no reaction. Treatment should be administered in this manner three or four times a month.

By the second method arsphenamine is injected in the form of arsphenamized serum. There are three ways in which this may be done, the Swift-Ellis, the Ogilvy, and the reinforced. In the Swift-Ellis method an intravenous injection of arsphenamine is given and one hour later about 40 cc. of blood are withdrawn and allowed to clot. The serum is pipetted off and centrifuged at 3,000 revolutions per minute for one hour. It is then inactivated (in a water bath) at 56°C. and is ready for use. In the Ogilvy modification the serum is arsphenamized in vitro in the following manner: 40 cc. of blood are withdrawn, allowed to clot, and the serum centrifuged. To the clear serum is added the requisite dose of arsphenamine or neo-arsphenamine (not more than 0.5 mg.), incubated at 37°C. for one hour, inactivated in a water bath at 56°C. for one half hour and it is then ready for use. In the reinforced method to the arsphenamized serum of Swift-Ellis is added 0.1 to 0.3 mg. of arsphenamine and treated similarly to the Ogilvy modification. The Ogilvy modification is the best to use in mild cases or at the commencement of intraspinal medication as the dose of arsphenamine is accurately known, but towards the end of the course and in severe cases the reinforced method gives better results. In administering intraspinal arsphenamized serum, a lumbar puncture is done, and sufficient fluid removed for examination; a small amount of cerebrospinal fluid is allowed to run into a glass cylinder, the arsphenamized serum added, and the whole thoroughly mixed and allowed to run back into the intrathecal space by gravity. Arsphenamized serum prepared by any of the three methods should be injected within one hour from the completion of inactivation, otherwise it becomes toxic. Following the injection the patient should remain in bed, for about forty-eight hours, with the foot of the bed raised. Injections of arsphenamized serum should be given not oftener than every two weeks, except in cases of paresis when weekly injections are permissible.

The specimen of cerebrospinal fluid removed by lumbar puncture should be examined for four reactions in every case, i.e., the cell count, the estimation of globulin, the Wassermann, and the colloidal gold tests. The cell count should be made within an hour from the withdrawal of the fluid as the cells disappear rapidly on standing. For clinical purposes it is unnecessary to deter-

mine the type of cell and the count can be made rapidly and as accurately as required with a Fuchs-Rosenthal counting chamber. In a normal fluid less than five cells per mm. will be found. If more than five and less than ten, the count is suspicious and if more than ten definitely pathological. The butyric acid or the ammonium sulphate tests are sufficiently accurate for estimating any increase in globulin content. There is a quantative globulin test but it requires a well equipped laboratory. The presence of globulin in a spinal fluid is evidence of irritation of the neuraxis. These two tests should be done as soon as possible after the withdrawal of the fluid and can be performed easily in any office laboratory. The Wassermann and the colloidal gold tests must be done by a trained laboratory worker. For the first the cerebrospinal fluid should be tested in amounts of 0.1, 0.2, 0.5, 1.0, and 2.0, cc.; the higher dilutions often are negative in a positive fluid. The colloidal gold reaction is one of the most informative examinations. In mesodermal neurosyphilis a typical reading would be 0012321000; in degenerative myelitis 1234443210; in degenerative encephalitis 5555543210. Asymptomatic cases showing colloidal gold reactions of the latter two types need intensive treatment, particularly with the last, as they are indicative of a later developing tabes or paresis unless thoroughly treated.

A large minority of cases of early syphilis will show a completely negative cerebrospinal fluid. In these cases if proper and adequate treatment for the systemic infection is administered neither the patient nor his medical attendant need ever fear a later developing neurosyphilis, and a second lumbar puncture is unnecessary. Should treatment lapse before eradication of all the *treponemata* is effected, another examination must be made on the resumption of treatment as there is strong probability of an infection of the nervous system occurring in the interim.

The management of those cases that show positive reactions in the cerebrospinal fluid is dependent on the severity of the infection. As most of these cases are asymptomatic the degree of positivity of the fluid must be, perforce, the measure of the degree of infection. These cases may be classified as follows:

A. asymptomatic: a. mild or beginning infection; cerebrospinal fluid findings: 1. cells 0 to 5; globulin increased; Wassermann negative in 2.0; colloidal gold negative. 2. cells: 5 to 10, or more; globulin negative; Wassermann negative in 2.0; colloidal gold negative. 3. cells more than 5; globulin increased; Wassermann negative in 2.0; colloidal gold negative.

b. severe or advanced infection: 1. cells normal or increased; globulin normal or increased; Wassermann positive in at most 2.0; colloidal gold negative. 2. cells normal or increased; globulin normal or increased; Wassermann positive or negative; colloidal gold positive.

Class (a), i.e., those cases in which neither the Wassermann or colloidal gold reactions are positive indicate a less advanced and less severe type of infection than class (b). They should receive about fifteen injections of arsphenamine, and twenty injections of mercury and moderate doses of potassium iodide in the first six months. At the end of that time a second lumbar puncture should be done and if the fluid is completely negative, as it will be in many of the cases, their subsequent treatment should be similar to that for a case of generalized syphilis, excepting that a third lumbar puncture should be done six months after all treatment is completed. If the fluid remains the same, or the positivity has increased, either the combination of intravenous arsphenamine and hypertonic salt solution, or intraspinal injections of arsphenamine (by courses of eight injections with six months' rest intervals between courses) should be continued until the fluid is negative. Thereafter the fluid should be examined every six months while the patient is completing his three year intravenous-intramuscular course, and yearly after completion of treatment, for three years. Any return of positivity in the fluid means the resumption of adjuvant therapy.

Class (b), i.e., those in which the Wassermann or the colloidal gold reactions are positive should receive the same preliminary treatment, i.e., fifteen injections of arsphenamine, twenty injections of mercury, and potassium iodide in moderate doses for the next six months and then the fluid should be examined again. In only a few cases will it be found negative, in which event treatment similar to that described for the former type should be administered. In those cases in which the fluid still is positive in any of the four tests, intraspinal injections of either arsphenamine or arsphenamized serum, preferably the latter, should be given until the fluid is negative, in courses of eight injections with six months' rest intervals, between courses. A similar follow up treatment as for the former type is then indicated but it is better to make at least five yearly examinations following cessation of active treat-

ment. These cases should really remain patients throughout the remainder of their lives and receive a complete physical, serological, and cerebrospinal examination every year or so to detect any recurrence for positivity in the Wassermann or colloidal gold tests means a deep seated infection and an increased difficulty in eradicating the disease.

In cases of syphilis that have not had a lumbar puncture there is one definite sign that indicates urgently an examination of the cerebrospinal fluid. A persistently positive Wassermann reaction in the blood, and by persistently positive is meant one remaining after the administration of at least fifteen injections of arsphenamine, and a corresponding amount of mercury and potassium iodide, frequently means a neurosyphilitic infection and requires a lumbar puncture. If the fluid is positive, adjuvant therapy is essential as intravenous therapy alone has not been controlling the disease.

The pathology of asymptomatic neurosyphilis is probably similar to that of symptomatic neurosyphilis of the mesodermal tissues but it cannot be classified clinically as can be done with the symptomatic type. Symptomatic syphilis of the neuraxis is classified pathologically into

A. syphilis of the mesodermal tissues
a. meningo-vascular
b. vascular
B. parenchymatous neurosyphilis.

It should be understood that this classification is based on the location of the maximum severity of the infection for unquestionably all the tissues of the neuraxis are involved in a greater or less degree in each type.

Meningovascular mesodermal neurosyphilis comprises the majority of cases of neurosyphilis. All cases in which the cerebrospinal fluid is positive and that do not show the clinical signs of degenerative myelo-encephalitis are classified in this type. The multiplicity of signs makes it impossible to describe them in detail or even to list them. Every case presents a different symptomatology from the last and a catalogue of the clinical signs of this type would be a résumé of the signs of organic disease of the nervous system. It is essential, therefore, that every case displaying symptoms of organic nervous disease should be examined carefully, with the thought of neurosyphilis in mind, and if there are no contraindications, such as possible tumour of the posterior fossa, a lumbar puncture should be made. The blood Wassermann reaction is not of great value as it is frequently found to be negative but the cerebrospinal fluid is always positive. The typical fluid finding in this type of nervous syphilis is as follows: cells usually increased over five; globulin usually increased; Wassermann usually positive in 2.0; colloidal gold 0012321000.

Cases of meningovascular mesodermal neurosyphilis should commence treatment with four weekly intramuscular injections of mercury and moderate doses of potassium iodide, to prevent the occurrence of a destructive Herxheimer reaction. This should be followed by seven injections of arsphenamine and mercury and then adjuvant treatment should be combined with the routine arsphenamine, mercury, and potassium iodide. Courses of eight intraspinal injections of arsphenamized serum, with three monthly intervals between courses, should be administered until the fluid is negative and inflammatory clinical signs have disappeared and then systemic treatment, continued for several years after all serological signs have returned to normal. Half-yearly examinations of the cerebrospinal fluid should be made until three years after the cessation of active treatment, and yearly clinical and serological examinations for the remainder of the patient's life.

Vascular mesodermal neurosyphilis displays the signs of vascular insult to nervous tissue, i.e., symptoms of cerebrospinal aneurism, hæmorrhage or thrombosis, identical clinically with those due to non-syphilitic vascular cerebrospinal disease. In these cases the blood Wassermann reaction is positive, but the cerebrospinal fluid is negative, for with purely vascular disease there is not sufficient meningeal inflammation to demonstrate itself in the fluid. These cases require intravenous and intramuscular treatment only, and should commence their systemic therapy with a month's mercury and potassium iodide to guard against the dangerous Herxheimer reaction. They should be treated for several years after the blood Wassermann becomes negative and should be examined yearly after active treatment has ceased. Such patients should lead a life similar to those suffering from cardio-vascular disease in order that undue strain may not be placed on a weakened circulatory system.

In parenchymatous neurosyphilis degeneration of the neurones predominates. Such cases undoubtedly begin as a mesodermal infection but the immune reactions eliminate much of the disease process in these structures leaving colonies

of the treponema, that have spread to the parenchyma by contiguity, unaffected. As these colonies are more or less isolated from the blood and other antibody forming structures they are free to proliferate unhampered, particularly as the tissues in late syphilis seem sensitized to the disease, in that a smaller number of the organisms produce more destructive lesions than the mass infection of the generalized stage. Grouped around the specialized cells of the nervous system they are difficult to reach with medication and it is on these two factors that the difficulty in curing paresis, tabes, and the rarer syndromes of this type depends. Parenchymatous neurosyphilis is classified clinically into paresis, tabes, and a few other rarely found clinical types. It must be understood that this classification is purely descriptive and that both paresis and tabes have the same pathological entity, i.e., degenerative encephalomyelitis, with a different localization of the maximum severity of the infection; in the former case in the cerebral tissues; in the latter in the spinal.

Tabes or degenerative myelo-encephalitis in the early stages is mistaken frequently for other diseases. The pains are often diagnosed as rheumatism or neuralgia and the crises, particularly the gastric and intestinal, for a surgical condition in the abdomen. Pains of a lightning character that show a tendency to chronicity should lead to a careful physical and serological examination for tabes, and an acute recurring condition in the abdomen should be examined in a similar manner before surgical interference is advised. In degenerative myelo-encephalitis the blood Wassermann is as frequently negative as positive and consequently the examination of the cerebrospinal fluid must be the diagnostic criterion for the etiology of the clinical signs. A typical tabetic fluid usually shows the cells slightly increased, the globulin increased, the Wassermann positive in at most 1.0, and the colloidal gold test giving the reaction 1234443210. In certain cases of tabes the cerebrospinal fluid is completely negative. If there is no progression of clinical signs the process may then be considered as burnt out and no treatment is indicated. If the case is clinically tabes and shows progression, it should be treated for the disease similarly to those in which the fluid is positive. Frequently this negative fluid will become positive after the first few intraspinal injections and then will follow the course of the ordinary case under treatment.

Treatment for the etiological factor in degenerative myelo-encephalitis must be administered with great care in order not to precipitate reactions that will produce permanent destruction of important centres. The case should commence treatment with a month's mercury and potassium iodide; this to be followed by eleven weekly intravenous and intramuscular injections. At the end of this time, while the patient is still kept on routine treatment, he should be given a course of five or six spinal drainages and then placed on gradually increasing doses of arsphenamized serum in courses of eight, with four month intervals between courses until the inflammatory clinical signs disappear and the fluid becomes negative. These cases need long continued treatment and in only about seventy-five per cent can arrest be expected. A large percentage of the remainder improve greatly but in a few no results are obtained. The earlier a case is placed on treatment the better the result that can be anticipated. It is in the advanced cases that poor results occur. In addition to specific treatment cases of tabes require physical symptomatic therapy for the ataxia, incoordination and loss of joint position sense.

Paresis or degenerative encephalo-myelitis is the most serious form of neurosyphilis, and the most resistant to treatment. The early signs are misinterpreted more often than those of any other disease. The so-called classical picture with megalomania is seen seldom even in advanced cases, more often the syndrome shows little more than a rapid deterioration of the mentality. In early cases there is a neurasthenic condition with depression and lack of attention. Simple tests show a narrowing of the whole psychic field. In paresis the blood Wassermann is usually positive and the cerebrospinal fluid almost always so, giving the following type picture: cells increased; globulin positive; Wassermann positive in 0.1; colloidal gold 5555543210.

A case of degenerative encephalo-myelitis needs urgent intensive treatment. The preliminary mercurial-iodide course should be shortened to one week, and after the first three or four intravenous treatments intraspinal injections of reinforced arsphenamized serum should be commenced. Weekly intraspinal injections should be given in courses of twelve, with three month intervals between courses and both intraspinal and systemic treatment should be continued a very long time. In cases in which a more intensive treatment is indicated the intrathecal injections should be made into the cisterna magna by cisterna punc-

ture, or into the lateral ventricle. In a majority of early cases arrest of the disease may be expected, in late cases about thirty per cent are arrested, fifty per cent improved, and the remainder are hopeless.

The prognosis of mesodermal neurosyphilis is good both as regards relief from inflammatory symptoms and eradication of the disease. In degenerative myelo-encephalitis (tabes) a few cases are hopeless, the remainder showing great clinical improvement and in a majority arrest of the disease. In degenerative encephalo-myelitis (paresis) a larger percentage are hopeless but in a small majority marked amelioration is obtained and in a moderate number arrest of the process. The earlier a case of neurosyphilis is placed on proper treatment the greater probability of cure. Without question the time to treat neurosyphilis is before clinical signs, with their indication of a possible permanently damaged neuraxis, appear. Adequate treatment of primary and early generalized syphilis is the treatment *par excellence* for neuroinfection.

No patient with symptomatic neurosyphilis should be assured of cure, but should be told that though the disease can be arrested, evidence of destructive lesions will be permanent. Neither should marriage be permitted unless the other party is acquainted with the condition, not because of the danger of transmission of the disease but because a further development may lower the patient's earning capacity. It is improbable that clinical neurosyphilis can be cured but the disease may be arrested in a large majority of cases, amounting to eradication in the mesodermal and early degenerative types and to a great improvement in the late parenchymatous varieties.

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The Value of Milk Acidified with Lemon Juice.—Alfred F. Hess and Milton J. Matzner, New York, add fruit juices directly to the milk formulas, instead of giving them to the infants separately and between feedings. Their object in diverging from this practice was twofold—to simplify the technique of feeding, and to render the milk more acid. Lemon juice or orange juice can be added directly to cow's milk without bringing about curdling. By mixing approximately 21 c.c. of lemon juice with a quart of milk, its buffer action is markedly reduced and the hydrogen-ion concentration increased from *p*H 6.64 to about 5.54. In this way, cow's milk is rendered more digestible, and its true acidity in the stomach is made to resemble more nearly that of human milk. Infants who received milk prepared with lemon juice thrived well for long periods. Lactic acid or hydrochloric acid have been added to cow's milk with the same object in view. One advantage of using lemon juice for this purpose is that it also supplies antiscorbutic vitamin, thus compensating for the deficiency of this essential factor in milk. Egg yolk can be combined with the mixture of milk and lemon juice with but slight alteration of the hydrogen-ion content. This combination is well borne by infants. By this means a food is prepared which compensates for the nutritional deficiencies of cow's milk, furnishing both the antiscorbutic and the antirachitic factors, as well as additional fat-soluble vitamin and iron.—*Jour. Am. Med. Ass.*, May 17, 1924.

Cholecystostomy versus Cholecystectomy.—John B. Deaver and Stanley P. Reimann, Philadelphia, state their views as follows: Cholecystectomy is the operation of choice. It is as safe as cholecystostomy; it removes the cause of the vicious circle; the patient does not miss an organ which has probably been functionless or in which function has been much impaired for some time, and the chances of complete recovery or cure are greater, recurrences being less frequent and usually less serious than after cholecystostomy.—*Jour. Am. Med. Ass.*, June 28, 1924.

THE SILHOUETTE RADIOGRAPH
AS AN AID TO
CLINICAL DIAGNOSIS

A. P. Bertwistle, M.B., Ch.B.

IT is a striking fact that whereas a radiographic negative clearly indicates the outline of the flesh, a print from such a negative fails in this particular. The result of this loss is that the print loses much of its value; it is something apart from clinical diagnosis, and gives no evidence of the points on which the clinical diagnosis was made.

Some text-books seek to indicate soft parts by over-exposing the prints, but they do so at the expense of the bony definition. A radiograph is intended to show bones with the greatest possible distinctness.

The silhouette* radiograph was evolved with the object of at once correlating the clinical findings with those of the roentgen rays. The ordinary radiograph is largely a shadow photograph of bone; the silhouette radiograph is one of flesh and bone. The method is simple in the extreme. A negative is held up to the light, or placed in an illuminator, and the margin of the skin, which is always apparent, is scratched with a mounted needle. When the negative is printed the margin, thus outlined, shows as a black line. The background is now filled in with Indian ink, and the silhouette radiograph is complete.

This method of printing enables one to form an idea of what the radiograph findings will be, when certain deformities are next met with. A silhouette radiograph of a dislocated shoulder reveals the loss of the deltoid fulness—the basis of Hamilton's ruler test—and increased axillary girth—(Calloway's test). When such alterations in the shoulder are next encountered it will be easy to visualize an empty glenoid fossa, and the head of the humerus lying beneath the coracoid process. The bulbous finger tip, and spindle fingers, are suggestive of a periosteal whitlow, and tuberculous dactylitis respectively. In an injury to the knee, loss of extension, and a transverse depression over the site of the patella make a fracture of that bone highly probable. The loss of the gentle sweep of the shoulder points to a dislocated, or fractured clavicle. On seeing a hand radially deviated, and displaced backwards in the "dinner fork" position, it is easy to visualize that the underlying cause is an impacted fracture of the radius, with backward displacement of its lower end. The "wave deformity" of the forearm, with dorsal trough and ventral crest can only mean a "greenstick" fracture of radius and ulna.

Thus the underlying cause of any swelling is readily ascertained. Where the swelling is due to bone disease it is intimately associated with that disease. Where, on the other hand, the bones are normal the cause must be sought elsewhere.

The geography of sinuses injected with bismuth, or into which a probe has been passed can be readily studied. Foreign bodies instead of appearing "in space" show their proper relations as regards depth and position.

By means of the silhouette radiograph it is possible to confirm the impressions formed by palpation. In a dislocated elbow it is easy to see how the hard mass anteriorly, and the loss of resistance posteriorly are caused.

Muscular wasting is an important sign of bone tuberculosis. In the selecting of many plates considerable help was given by this feature. Malignant, or rachitic disease is not so accompanied, nor is osteomyelitis in which condition irregularities due to sinuses are often seen. The adequacy, or otherwise of the coverings of a stump is apparent. All this is lost in the simple radiograph.

An important asset of the silhouette radiograph is the manner in which it shows the position of the limb at the time of the screening. In consequence of the risk of loss and breakage it is not always advisable to send negatives by post. I would suggest that if the skin outline were scratched on the negative before a print was made, the practitioner would at once recognize its increased usefulness.

The addition of the silhouette should aid diagnosis in that it imparts a much needed reality to the radiograph.

Reference

*X-ray prints. A Suggestion. *Brit. Jour. Surg.*, January, 1923.

Case Reports

A FATAL CASE OF DIABETES MELLITUS COMPLICATED BY INFECTION*

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Montreal

The object of this communication is to record the clinical course of a case of mild diabetes, which was complicated by infection; and comment on the treatment of diabetes mellitus in the presence of this frequent complication.

The patient, a French Canadian male, aged 57 years, came to the Montreal General Hospital complaining of a "sore toe." About one month before admission, while trimming the nail of the third left toe, he tore the matrix. The toe became red, tender and swollen; then, within a week it became black, and lost all sensation. This condition persisted till admission, and he also suffered from short attacks of intermittent stabbing pain running down the leg. Otherwise, he considered himself in perfect health, and denied any previous illness whatsoever. When closely questioned, however, he admitted having had some excessive thirst and polyuria for the past five or six years, and these symptoms had been more marked during the past month. There was no loss of weight. His personal history was good, and there was no traceable diabetes in his family.

The physical examination on March 10th. showed a well-developed, well-nourished, ruddy male. His tongue was red and moist. Systemic examination was negative, with the exception of the cardio-vascular system. Under this heading, the positive findings noted were, a transverse cardiac dullness of 12 cm., a blood pressure of 164-80, and marked sclerosis of all palpable arteries. The left foot was normal in size and temperature. Sensation was diminished over the entire foot, and the middle toe was black, hard, dry, gangrenous, with entire absence of sensation. No arterial pulsation could be felt at the ankle, and that in the popliteal artery was just perceptible.

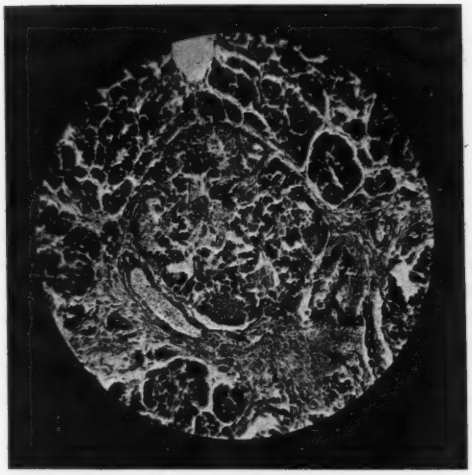
The chart below gives the clinical course and laboratory findings.

As will be seen, therefore, his condition, both from the laboratory and clinical standpoint, except for a temporary improvement immediately after admission, became progressively worse, and on the sixth day after admission it was evident that amputation was imperative, but preoperative measures were necessary, as he was deeply comatose, with a very weak pulse and a high degree of sugar in the blood. He was therefore given intravenous injections of 3,000 cc. of Ringer's solution, with fifty units of insulin, which caused some improvement, and the leg was then amputated under gas-oxygen anæsthesia. Further injections of Ringer's solution, and another fifty units of insulin were given later in the day, and improvement was evident. A generalized *Streptococcos Hœmolyticus* infection developed and he died on the fourth day after operation.

*From the Department of Metabolism, Montreal General Hospital.

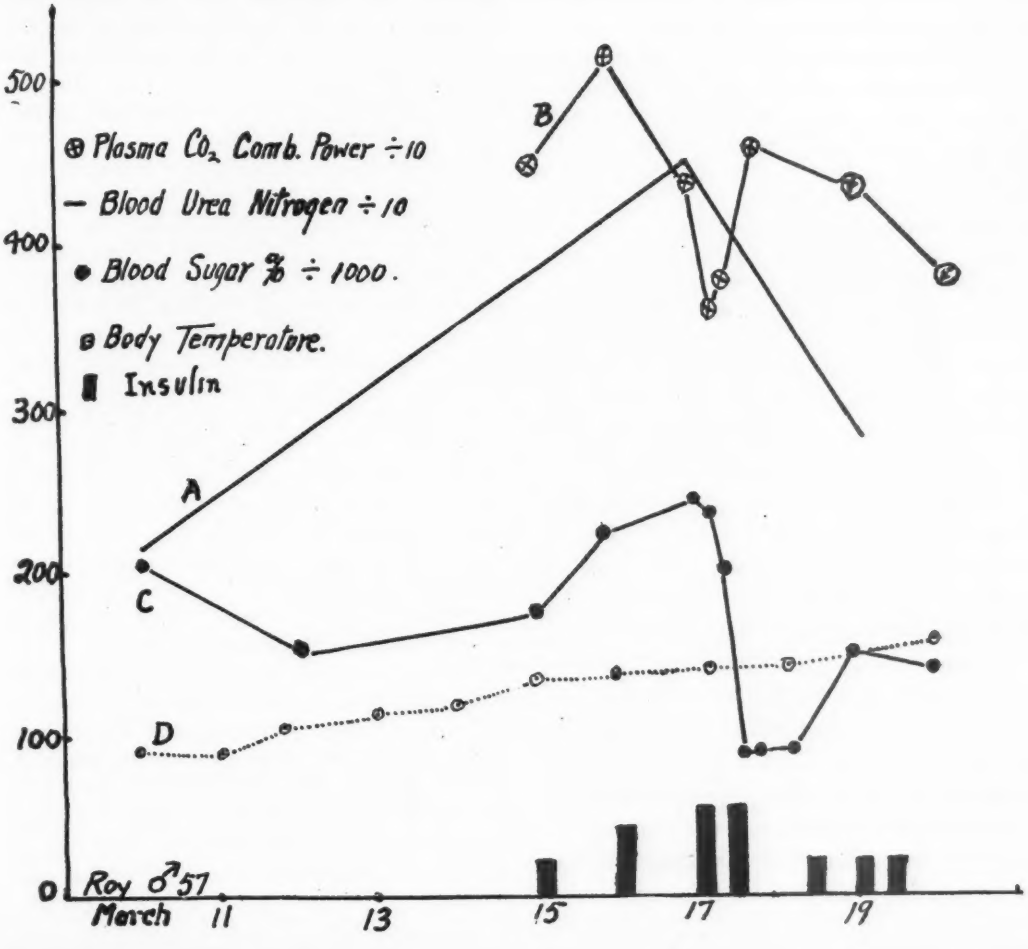
Date	Urine		Blood		Insulin Units	Diet Cals	Glucose content *	Temp.	Remarks
	Sugar grms.	Ketones	Sugar %	CO_2 Vol. %					
	am								
10th.	14	0	0.208		0	336	31	100	Admitted—Green Day diet.
11	3	0			0	336	31	101	
12	4	trace	0.153		0	336	31	101	Seen by surgeon. Expectant treatment advised till diabetes controlled.
13	10				0	336	31	101	Entire dorsum foot red, swollen.
14	60				0	564	41	102	Irrational at times—Lymphangitis.
15	32		0.178	45	20	764	52	103	Irrational: Tongue dry and beefy. Foot swollen but cold and without sensation. Hæmorrhagic blebs on dorsum.
16			0.217		40	0	0	102	Pulse rapid, weak.
17	2	0	0.244		100	40	40	104	Comatose, aroused with difficulty—operation.
18	2	0	0.082	41	20	0	0	102	Rational—pulse rapid but strong.
19	trace	0	0.153	44	40	0	0	105	Irrational at times. Stump infected—foul.
20	"	0	0.147	38	20	0	0	106	Comatose—died.

*Glucose—C + O. 1F + 0.58P (Woodyatt).



Microphotograph of pancreas, showing areas of degeneration in an island of Langerhans.

The post mortem findings were those of septicæmia. The *Streptococcus Hæmoloticus* was isolated from the liver, spleen and site of operation. There was general advanced sclerosis involving the entire arterial system. Histologically, the pancreas showed lesions, comparatively uncommon in nature, but which have long been associated with diabetes, namely, fibrosis of the islands of Langerhans. At least half of the islands showed partial replacement by dense hyaline connective tissue, while patches of sclerosis of the acinous tissue possibly indicated some healed infective process. The lesions in the islands, however, tempt one to ascribe to them the same cause as to the lesions characteristically found in the renal glomeruli in chronic vascular nephritis; certainly vascular degenerative processes were not lacking.



From the viewpoint of metabolism the course is well illustrated by the following chart. The dates are plotted in the abscissæ.

Discussion

The case is of interest from many aspects. It corroborates what Allen has recently pointed out, namely, that mild chronic diabetics though without subjective symptoms, are constantly menaced with the possibility of infection, so commonly in the form of carbuncles or gangrene. In some way a persistent hyperglycæmia predisposes, not only to infection directly, but also to degenerative vascular processes which result in gangrene and finally sepsis, and this is responsible for a majority of deaths in diabetes. Another interesting feature is the degree of absorption of split proteins which can take place from such an infected area, as manifested by the blood urea nitrogen curve, and the rapidity with which these are eliminated when the source has been removed. The rise in blood urea nitrogen could not be explained by the presence of a nephritis.

Both the shortcomings and the advantages of insulin treatment are illustrated. Repeated large doses of insulin failed to influence the hyperglycæmia appreciably, in the presence of the gangrenous limb; whereas, its administration following amputation not only lowered the blood sugar and maintained it at a normal level, but increased the plasma CO_2 combining power. It must be remembered, however, that several factors are to be considered. Previous to operation, two influences were tending to combat the effect of the insulin, a general septicæmia and a local infective condition. During the first two days following operation one such influence had been removed, to return with local reinfection.

Another lesson to be learned, is the possible danger of delaying radical surgical interference. In the present instance the patient may have had a general septicæmia even before his admission to the hospital, so that earlier amputation would not have altered the issue. At the same time, mild or even severe diabetes can be better controlled by insulin after the removal of the limb bearing the infected focus, provided a reasonable time be permitted for pre-operative medical treatment.

Grateful acknowledgement is due to Drs. A. T. Bazin and Guy Johnson, of the surgical service, for co-operation in the study of this case.

A CASE OF CEREBRAL TUMOUR

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The following case illustrates the difficulties of an early diagnosis of a glioma of the brain, the methods of its localization, its operative treatment, and its clinical course and pathology. About twenty per cent of brain tumours are removable; all are ultimately fatal without removal; early diagnosis offers their unfortunate possessors the only chance of cure.

Mrs. S., Montreal General Hospital No. 1,075, Canadian, widow, aged 40 years, was admitted into the medical service of the hospital, February 27th., 1923, complaining of "pain in the stomach, nausea, vomiting, and loss of weight and strength." At the age of seventeen she had dyspepsia, loss of appetite, abdominal pain, and fainting attacks; while a nurse in the Montreal General Hospital she had an appendectomy performed with cure of the gastric symptoms. She had influenza in 1919. Three and a half years prior to her present admission an operation for goitre was performed at the Mayo Clinic. For five years before admission she had had amenorrhœa following a nervous shock. She has been married fifteen years, and has had one child. In the summer of 1922 she had "neuritis" in the right shoulder, and there has been pain in the right chest off and on ever since.

Her present illness began suddenly about January 15th., 1923, with epigastric pain, loss of consciousness, and vomiting of bright red blood; she was unconscious about one hour. Pain, coming on about half an hour after meals, of the usual type in gastric ulcer, and associated with vomiting, has occurred daily since. She has lost in weight about six pounds. The vomitus contained blood since the initial hæmorrhage.

Physical Examination reveals a slight tremor of tongue and marked diminution of the pharyngeal reflex. Epigastric tenderness is present. Blood pressure 150 / 100, aortic second sound of bell-like quality. Her intelligence is good, but she is inclined to be emotional during examination; her knee jerks are increased. The rest of the general examination shows nothing of importance.

A barium series shows acceleration in emptying of the stomach, delay in entering the cæcum with distension of duodenum. Gastric test meal showed no free hydrochloric acid, total acidity three. Visible and occult blood appeared again on March 2nd. She was put on a Lenhartz diet, followed by Sippy's; then a soft diet.

She had a mild attack of gastric tetany (carpopedal spasm) on March 9th. On March 15th. she uttered a cry and had a typical epileptic attack. She was unconscious for ten minutes and this was followed by mental dullness and headache. She was quite herself next day. Following the epileptic attack Dr. F. H. Mackay, neurologist to the hospital, examined her, and gave a negative report, but elicited a history of similar attacks prior to her present admission to the hospital. No report of an examination of the eye fundi was noted in her report. She was discharged, improved, on March 19th., with the diagnosis of gastric ulcer and epilepsy, a treatment for which was prescribed.

She was readmitted, as a private patient, case No. 1,920, under Dr. Gordon, on April 12th, 1923, with failing vision, failing memory, and severe headache. Following her discharge in March she became rapidly worse; she became very nervous, suffered with very severe headaches, and owing to weakness remained most of the time in bed. On April 9th her eyesight, especially in the left eye, became suddenly much worse, and after this the headache became more severe with exacerbations on the left side lasting an hour at a time. She had vomited four or five times while at home. Marked epigastric tenderness still persisted. Examination of the nervous system revealed a drowsy, dull individual, apparently suffering from severe headache, which kept her awake at night. The intelligence was below normal. Her memory was greatly impaired and she took no interest in her own, or in relatives' affairs. She did not carry on a conversation, but answered questions fairly quickly and intelligently. She was irrational at times, and was worse mentally during

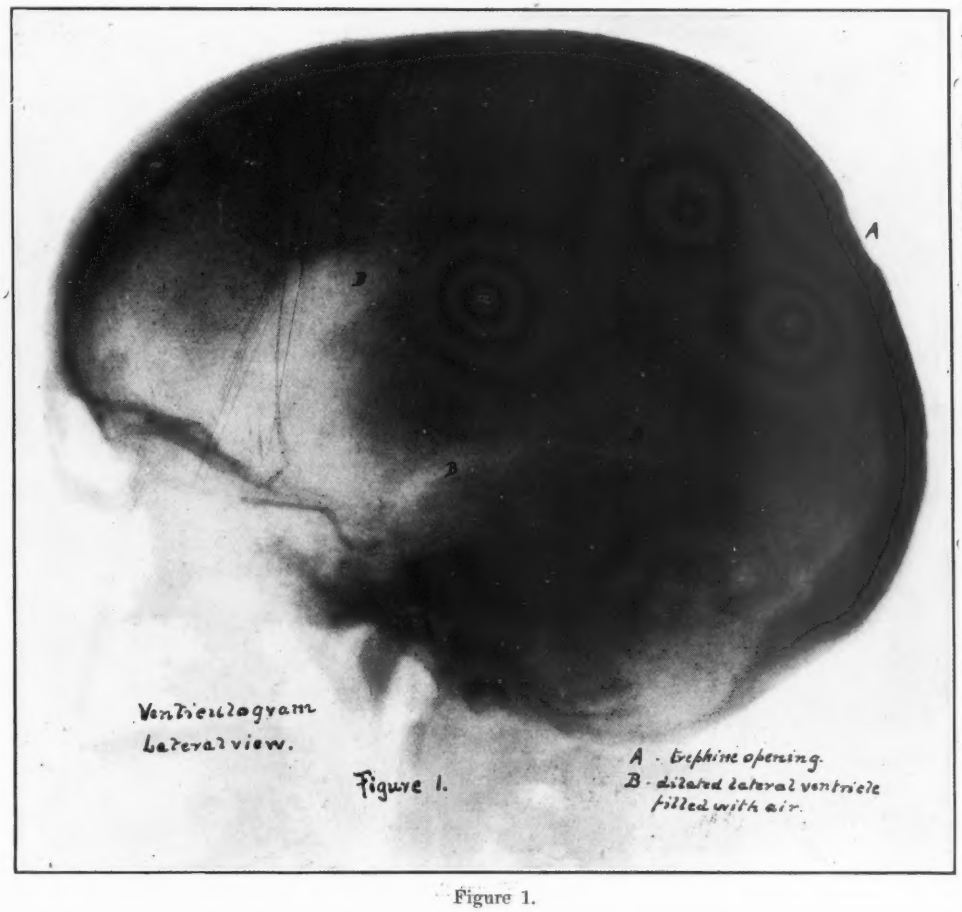

Figure 1.

the periods of severe headaches. There was no difficulty in articulation of words, but in conversation, which was laboured, she misplaced some words. Smell was normal; vision was impaired, but owing to the mental condition it was hard to get an idea of the degree of impairment. Examination of the fundi showed marked optic neuritis and bilateral hæmorrhages, most marked on the right side. No oculomotor paresis was noted; the fifth nerve appeared to be normal, and also the sixth. There was slight paresis of the lower portion of right side of the face. There was definite loss of motor power in the right hand and arm, diminished sensation in right arm, and

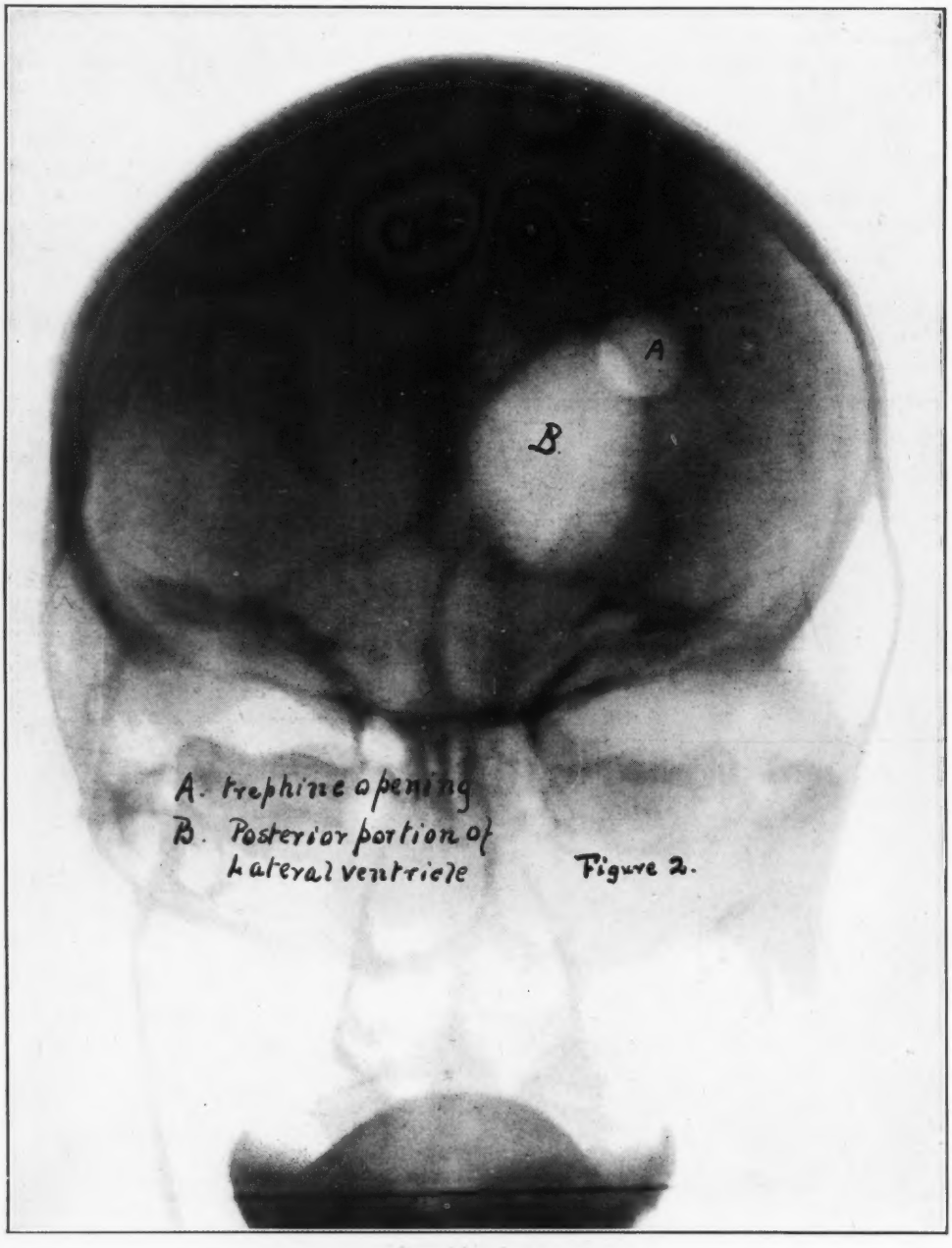

Figure 2.

doubtfully diminished sensation in right side of body. The right patellar reflex was markedly increased, the left increased. A suggestive right Babinski was elicited but no clonus; slight stiffness of the neck muscles existed and a suggestive Kernig on both sides. Abdominal reflexes were absent.

Two days later she was brighter, answered questions well though making mistakes in her words; she wrote to dictation and copied words, apparently understood names and uses of objects handed to her; there was no Babinski. She had urinary incontinence on April 13th for the first time. The blood Wassermann was negative.

She was seen by me in consultation on April 14th., and a lumbar puncture with manometer attached revealed a pressure of thirty-two to thirty-four millimetres of mercury. The cerebrospinal fluid was clear, colourless, and contained thirty cells to the cubic millimetre. Pandy test positive. I suggested ventriculography to confirm the presence of a tumour in the left hemisphere, most likely in the tempero-sphenoidal lobe. The diagnosis was based on the headache, vomiting, optic neuritis, right sided facial paresis, upper extremity paresis, mental impairment, and increased pressure of the cerebro-spinal fluid.

On April 17th the right lateral ventricle was tapped and about 60 c.c. of clear fluid under increased pressure was replaced by air. (If 25 cc. is easily obtained no tumour exists on the side aspirated). After the injection of air the x-ray showed a greatly dilated lateral ventricle on the right side, and the fact that no air had passed into the left lateral ventricle. A second x-ray, a

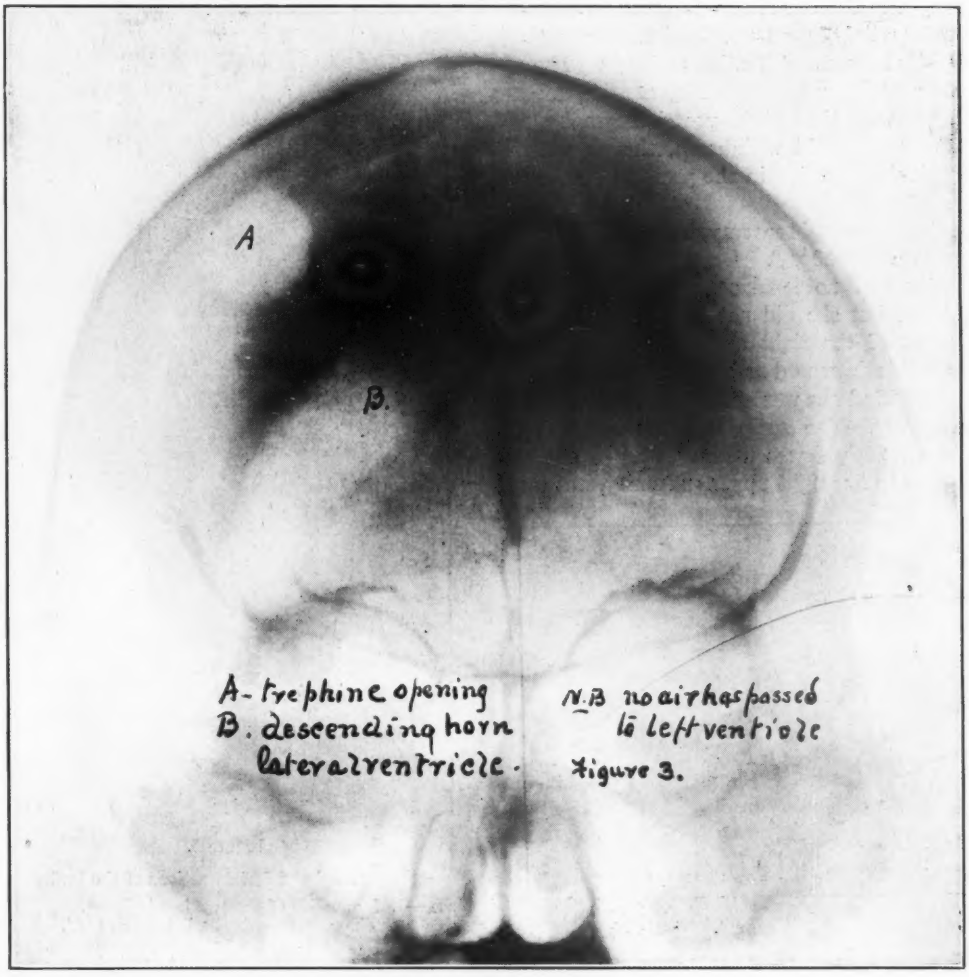

Figure 3.

day or two later, showed again that no air had reached the ventricle on the left side. This indicated a block between them, or a greatly compressed left lateral ventricle. While there was no reaction and the temperature did not rise above $99^{3}/_{5}°$, her headache became intolerable. (See Figures 1, 2 and 3).

An exploratory craniectomy was done on April 20th., under intra-tracheal ether anæsthesia. A bone flap was turned down on the left side. The base of this extended from two inches in front to two inches behind the ear. The dura was found normal in appearance. A similar bone flap is shown in Figure 4. A needle was then passed into the lateral ventricle which yielded only a small quantity of fluid, due to the fact of the ventricle being encroached upon by the tumour. The dural flap was turned down and the cortex seen and palpated. But no tumour was made out. The bone at the bottom of the flap was removed to allow for relief of pressure, the dura was partially closed by suture and the flap replaced. The opposite ventricle was emptied by needle puncture as done at the time of the ventriculography, and about 40 cc. fluid withdrawn, though without appreciable reduction in the pressure on the left side.

She made a good recovery, her temperature did not rise above $99^{1}/_{5}°$. On April 21st, she apparently had no headache and there was no vomiting, but she did not talk; and the motor weakness of the right arm was more marked, though this decreased as her condition improved. On April 22nd she was answering questions fairly intelligently. The scalp incisions healed well. On April 28th I was unable to make out any weakness in her right upper extremity, but more hæmorrhages were seen in the fundus of the left eye; no other changes were noted. Incontinence of urine persisted. She was taken home in an ambulance on May 3rd; at this time she showed increased facial paresis.

At her home on June 30th she was able to say 'yes' or 'no' to questions, and did what she was told to objects in her left hand; the right was very little used. She had no headache and no vomiting. There was an immense protrusion at the site of the decompression, elevated two inches, with forceful pulsation. The bone flap was intact, though raised. She died on July 14th, three months

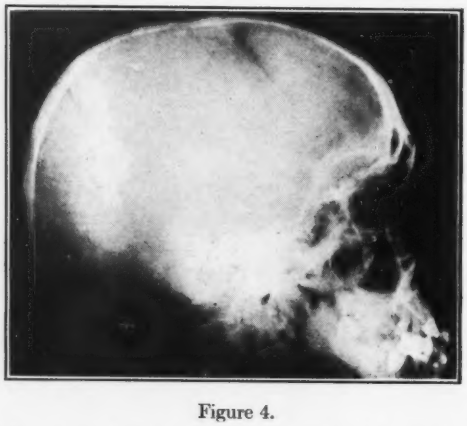

Figure 4.

X-Ray shows large bone flap some weeks after operation.

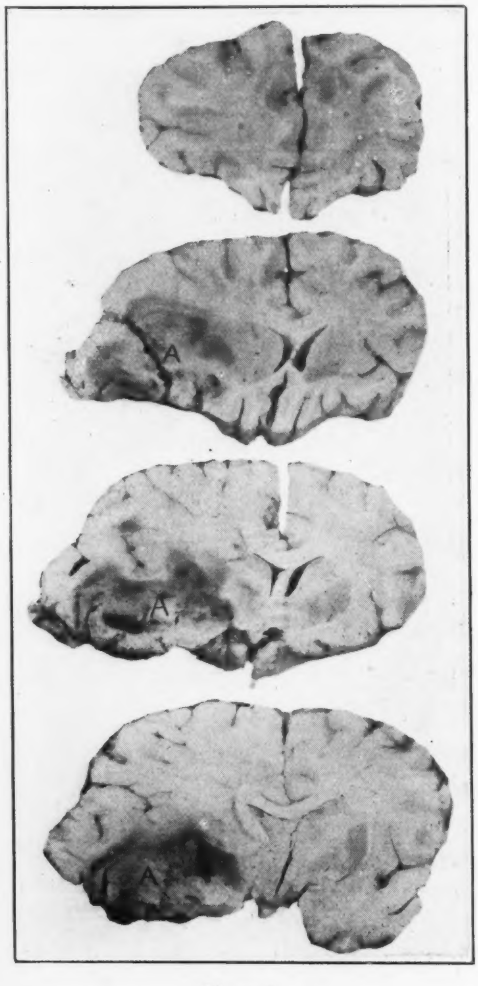

Figure 5.

Photographs of Serial Sections of the brain.

NOTE—1. Inequality of the two hemispheres.
2. The presence of a large tumor at 'A'.
3. Difference in the two lateral ventricles.
4. Compression of the right hemisphere.

after operation, and five months after her first gastric symptoms began. At the autopsy was seen a deeply placed glioma of the left tempero-sphenoidal lobe, which had rapidly grown to the surface, following the line of lessened resistance to the decompressed opening.

Discussion:

The signs and symptoms of gastric ulcer, sudden hæmorrhage, vomiting, pain and tenderness, with later the appearance of symptoms and signs of cerebral tumour, made a combination difficult of early interpretation. The site of the lesion was readily determined, contralateral from the right facial paresis and the paresis of the right upper extremity. The question as to whether it was a frontal or tempero-sphenoidal tumour was not so easy. The absence of any defect of articulation and a fair retention of intelligence rather suggested a post-frontal lesion. The motor weakness could be explained by pressure inwards on the internal capsule, rather than by cortical lesion in the post-Rolandic area when Jacksonian attacks would have been expected. There was no history of disagreeable olfactory sensations or "uncinate fits" as in another case recently in the hospital; the impression was that the tumour was central rather than cortical, and likely to be a glioma. The ventriculogram indicated gross intracranial pressure and a left-sided lesion.

The autopsy revealed a very striking difference in the size and shape of the two lateral hemispheres with a large fungating growth situated in the inferior surface of the left hemisphere. The left hemisphere throughout is larger, wider and thicker than the right. The difference in symmetry is most marked at the site of the fungating tumour, seen on the inferior surface. This tumour is friable, irregular and shows numerous large and small hæmorrhagic areas, and has destroyed the brain substance at its site. Both hemispheres show evidence of pressure. Their convolutions are broad and flattened and the sulci are not as marked as normal. The right hemisphere has been pushed to the right. After fixation in formalin, serial sections were made of the brain. The photograph illustrates the marked difference in size of the two hemispheres and the gross evidence of pressure. The tumour throughout shows evidence of rapid growth with multiple hæmorrhagic areas. It cannot be enucleated and blends imperceptibly with the surrounding brain tissue. Histologically the tumour is a rapidly growing glioma. (Figure 5.)

RUPTURE OF THE RIGHT RECTUS SIMULATING APPENDICITIS

R. I. Harris, M.B.

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THE history and findings in the following case appear to be sufficiently instructive to warrant publication.

Mrs. W., age 28, widow, was first seen December 25, 1922. For ten days previous to this date she had had a respiratory infection characterized by malaise, coryza and cough. In view of the subsequent findings, it seems reasonable to suppose that she had been suffering from influenza, especially since an epidemic of the disease in mild form was reappearing in this city at that time. She had not considered her condition sufficiently serious to call in a doctor. The cough had been the most distressing symptom. On the morning of December 24, 1922 she wakened feeling nauseated, but did not vomit. Her abdomen was diffusely sore, and this soreness was greatly aggravated by coughing. The pain in the abdomen became more severe towards evening, and localized in the right lower quadrant. She did not vomit, although she felt nauseated. Her bowels were constipated.

On the morning of December 25, 1922 she was still nauseated, and was suffering from constant abdominal pain in the right lower quadrant, greatly aggravated by coughing. At 11 a.m. her condition was as follows: Temperature 100.5°, pulse 86. She lay curled up in bed in an obvious attempt to relax the abdominal muscles. The abdomen was scaphoid and did not move on respiration. There was a sharply-defined area of tenderness in the region of the appendix slightly below McBurney's point. Its exact position was at the outer margin of the rectus and two fingers' breadths below a line joining the umbilicus to the anterior superior spine. This tenderness was easily elicited, and gave the impression that it was superficial, i.e., as soon as pressure was exerted on the abdominal wall the tenderness manifested itself. There was no cutaneous hyperaesthesia. A great deal of voluntary muscle spasm existed, and it was therefore difficult to determine the amount of rigidity present. There was a leucocytosis of 16,500 per mm., 80% of the cells being polymorphonuclear. The chest was clear, except that the breath sounds were diminished over the right side, probably because

of diminished movement. A few large coarse râles were heard. These were thought to be due to tracheitis. There was much tracheal irritation, with desire to cough. This, however, was suppressed because of the pain it produced in the abdomen.

The presence of a respiratory infection made the diagnosis difficult. The chest findings seemed inadequate to account for the temperature and leucocytosis. The tenderness was not quite that of appendicitis, it being of an extreme degree and superficial. A tentative diagnosis of appendicitis was made, however, and operation advised.

The abdomen was opened at 4.30 p.m. December 25, 1922, through a right rectus incision, under chloroform and ether anaesthesia. On splitting the rectus sheath the muscle was to all appearances normal, but on thrusting a pair of Mayo scissors into it in order to separate the fibres, the point of the scissors was felt to pass through a superficial layer of muscle into a cavity. On exposure, this cavity was seen to be a space formed by rupture and retraction of the deep layers of the rectus muscle. The posterior two-thirds of the muscle were involved in the rupture. The torn ends were frayed, and strands of muscle lay like fingers in the blood clot, which occupied the space between the separated ends. The muscle was dark grey in color, extremely friable, and did not bleed when handled. Cultures were taken from the area, but unfortunately no tissue was removed for microscopic examination. The peritoneum was opened and the abdominal viscera examined. They presented no pathological lesion. There was no evidence of appendicitis. The appendix was removed and the wound closed in the usual manner. No attempt was made to suture the ruptured fibres. They were too friable to hold sutures, and the intact superficial layer of the rectus was thought to be a reasonably efficient guard against hernia.

The patient had an uneventful convalescence, save for an elevation of temperature to 99° on five successive evenings. A few crepitations appeared in the right lung, but cleared up in two days. The cough disappeared in five days. She was discharged from hospital perfectly well three weeks after the date of her operation. No post-operative hernia has developed.

Cultures from the ruptured muscle were reported upon by Dr. I. H. Erb, Pathologist to the Hospital for Sick Children, as follows: "The direct smear showed large numbers of red blood cells, the majority of which were partially disintegrated. Only a few white blood cells were seen, and of these the mononuclears predominated. There were a few plump Gram positive bacilli, which tended to be club-shaped, but which were quite uniformly stained. No other organisms were seen. Cultures were made on sugar free red blood agar and on glucose broth. The agar plate remained sterile, but from the broth, after three days there was recovered a gram positive bacillus morphologically similar to those seen in direct smear. This bacillus grew very slowly on blood agar plates, requiring about four days for colonies to appear. The colonies were at first very fine, round and opaque. They reached their maximum diameter of 0.5 mm. in a week or eight days. Cultures on Loeffler's serum and broth also developed slowly, and sometimes not at all unless they were inoculated with a rather large amount of material. When growth did occur in broth it produced a uniform turbidity. The organism was non-motile and was non-pathogenic to white mice. Thus far it has not been identified."

Rupture of the right rectus in its lower third, i.e. in a position such as might give rise to symptoms simulating those of appendicitis, appears to be a rare event. It is not mentioned as a condition which might confuse the diagnosis of appendicitis in the exhaustive monographs on this subject compiled by Deaver, Kelly, Kelly and Hurdon, or Ochsner. Nor is it mentioned under appendicitis in Keen's System of Surgery, Choyce's System of Surgery, Ochsner's Surgical Diagnosis and Treatment, Johnston's Surgical Diagnosis or Douglas' Diseases of the Abdomen. On the other hand, changes in the muscles are known to be an accompaniment of epidemic influenza. Cole (1) reports several cases found at autopsy during the epidemic of 1918. The lesions have been very carefully described and illustrated by Klotz (2). The condition is primarily a focal degeneration of muscle fibres. It may become so extensive as to result in rupture of the muscle fibres, and when this occurs, haemorrhages are prone to take place. The recti are most frequently affected, but similar degenerative foci have been found in the pectorals, psoas, glutei and sterno-mastoid. It is probable that such muscle lesions account for certain post-influenzal sequelae, e.g., deep seated abscesses. The finding of organisms in the material obtained at operation may be of significance in this connection, though I am unable to explain why an unrecognizable species of organism should be present, rather than the influenza bacillus. In all the reported cases the muscular lesions of

influenza have been found at post-mortem, i.e., they have occurred in patients whose infection has been sufficiently severe to cause death. The case reported is unusual in that a severe muscle lesion occurred during an attack of influenza so mild as to leave the diagnosis in doubt.

REFERENCES

(1) C. E. COOPER COLE, *B.M.J.* Vol. 2; p. 566; Nov. 23, 1918. (2) *Studies in Epidemic Influenza—University of Pittsburg*, 1919.

RAT BITE FEVER

(*Spirochæta morsus muris*)

H. L. REDDY, M.D.

Montreal

The following case may be of interest, especially since only about a dozen cases are reported in Great Britain.

G. D., a married woman, age 24, presented herself for examination at the Women's Hospital of Montreal on November 28th., 1923, with the history of having been bitten in the lower lip by a rat, while asleep the previous night. The lower lip externally showed two incisions, slightly to the right of the mid-line, about one centimetre apart and about one centimetre below the line of the mucous membrane. Internally, and beneath the mucous membrane, which was not pierced, were two small hæmatomata corresponding to the external wounds. The lip was swollen and painful, but there was no evident glandular involvement. The temperature was normal.

The wounds were painted with iodine, hot foments were applied and the patient was given 3,000 units of antitetanic serum subcutaneously. The swelling subsided completely, and the lip was free from pain on the third day. On the ninth day it became markedly swollen, and on the tenth day the submental gland was palpable, indurated and painful. On the fourteenth day the submaxillary glands on the right side were also swollen, indurated and painful. The lip was markedly swollen and exquisitely tender, and when seen by Drs. Reddy and Thompson, seemed to fluctuate freely internally. It was incised deeply, but no pus was found, the tissues being markedly œdematous. She was then admitted to the hospital; the temperature was 101°, and the pulse 96; the physical examination was negative.

The following day her temperature was 103°, and, suspecting rat bite fever pathological examination of the blood was made, by smear and by culture obtained from blood at the site of incision; these were negative. India ink smears showed "suspicious looking organisms resembling spirochætes."

The patient was given 0.3 grm. of novarsenobenzol intravenously, and the incision in the lip was deepened by Dr. Guy Johnson. Within twelve hours the temperature was normal, and the swelling began to subside. She was discharged well in another week after receiving another novarsenobenzol injection (0.3 grm.). On January 7th., she returned with an acute exacerbation of the local and general condition. The lip and cervical glands of the right side were much swollen and painful; the temperature 103°, and the pulse 120. Physical examination was negative. She was given a third injection of novarsenobenzol (0.4 grm.) and in six hours the temperature and pulse were normal and the local condition improved rapidly. In a week's time she was discharged in good condition.

Three weeks later the patient had another similar acute attack, which was controlled by novarsenobenzol, and at weekly intervals for eight weeks following she was given prophylactic injections of novarsenobenzol and inunctions of mercury. A Wassermann reaction had proved negative. Two months have elapsed at time of writing, with no recurrence of the attacks.

The Gift of a Million Dollars to the University of Paris.—A gift of a million dollars has been made to the University of Paris for the erection, in the so-called University City, of a house primarily for Belgian students, and secondarily for students of Limburg and Luxemburg. This gift will bear the name of the "donation Biermans-Lapôtre," from the names of the donors, Mr. Biermans and Mrs. Biermans (née Lapôtre), who are of Dutch and Belgian origin respectively. They are, however, residents of Canada, in which country their fortune was made.—*Jour. Am. Med. Ass.*, May 31, 1924.

Editorial

RHEUMATIC FEVER AND ENDOCARDITIS

DURING these days of the reign of biochemistry, immunology, endocrinology, etc., the pendulum has swung away from morphology to a considerable extent. This is in a measure pardonable; too often, however, the reliable scientific data afforded by histopathological investigations have been neglected in chasing some theoretical will-o'-the-wisp to a renown-making "sure-cure". The work of these modern Ponce de Leon's of medicine almost invariably terminates in a chaos which is little better than the humoral pathology of pre-Virchowian times. It is, therefore, especially interesting at this time to find a problem attacked on morphological grounds, and most gratifying to note that substantial progress is made by this means.

The question of the pathogenesis of endocarditis has been the subject of considerable discussion in the past, more particularly as to whether the initial lesion in the valve leaflet is in a sense external or internal; that is, whether according to Ribbert the circulatory toxins injure the endothelium, with resulting roughening and thrombotic precipitation of bacteria, platelets, fibrin, etc., on the free margin; or whether, as others maintain, septic emboli lodge in the vessels of the valve and set up a primary foci beneath the endothelium with secondary injury and resulting vegetations. The *pros* and *cons* of this discussion naturally lead back to the question of the presence of blood-vessels in the valves and here opinions have been divided. The cause of such dissension, however, lies in too little appreciation of what Professor Oertel has designated "dependent morphological fluidity", that is, the continuous alteration, rearrangement, progression and regression of the body constituents from conception to old age. Gross*, in the course of his studies on organ circulation clearly showed that even the heart is undergoing a metamorphosis which could hardly be deemed possible in a continuously functioning organ. Moreover, along with other changes he showed that during fœtal life the valves are vascular, but gradually one by one, and in a quite definite order, they as a rule lose their vessels, those of the aortic cusp of the mitral valve being the last to disappear. In some individuals, however, this regression, part of the normal morphological flux, is delayed and in fact vessels may persist in those valves which normally retain them longest, throughout life. Moreover, vessels can always be demonstrated in valves showing the lesions of vegetative endocarditis. It was but a step from these findings to suspect, since endocarditis is more prone to follow rheumatic fever in early life and most likely to affect the aortic cusp of the mitral valve, that the prerequisite to the lesions of rheumatic fever in the valves is the presence of blood vessels. On this ground, likewise, can be explained why some people pass through several attacks of this disease without endocardial involvement.

More recently, as the result of histopathological studies in fatal cases of rheumatic fever conducted at the Hospital of the Rockefeller Institute for Medical Research, Swift† has formulated a conception of anatomical lesions in rheumatic fever, and shown that the pathogenesis of the involvement of skin, myocardium, valves, joints, etc., is essentially the same and consists of a proliferative perivascular type of sub-miliary granuloma. These have long been recognized in the heart muscle as Aschoff bodies, but the lesions elsewhere are very

*Gross, Louis, *The Blood Supply of the Heart*, Paul B. Hoeber, New York, 1921.

†Swift, H. F., The Pathogenesis of Rheumatic Fever, *Journal of Experimental Medicine*, Vol. xxxix, No. 4, p. 497, April, 1924.

similar. The nodules lie in close relationship to blood vessels and show a small central area of necrosis surrounded by characteristically staining cells which tend to fuse into giant cells and probably arise from the endothelium lining perivascular spaces. Associated with them are certain exudative features causing small round cell infiltration and œdema of contiguous tissues. The blood vessel may be compressed and even thrombosed.

These findings by Swift become of great interest when considered with the histological findings of Gross. As a result of their combined work a very rational theory of the relationship of rheumatic fever to endocarditis can be formulated. According to Swift, in acute rheumatic fever we are dealing with generalized submiliary granulomatous lesions which occur wherever the soil is found suitable for their production. Because of the morphological variations which occur at different age periods and in different individuals at the same age, variations in the degree of and location of these lesions take place and consequently we meet with a diversity of clinical pictures. If the soil in the cardiac valves is suitable because of early life or retarded regression of the blood vessels, valvular nodules result with damage to the adjacent endocardium and the formation of varicosities. If the soil is not suitable, the patient escapes without endocardial involvement.

T. R. Waugh

THE CAUSATION AND SIGNIFICANCE OF FEVER

THERE are those in the profession who will not admit that nature may have a conservative purpose in many if not all the abnormal phenomena accompanying departures from health in the animal or human body. By the majority however of the biological chemists of to-day it is recognized that almost all of the reactions during the progress of disease are definitely purposeful and conservative. The well known phenomena of hyperæmia, exudation, and leukocytic accumulation which characterize acute inflammation are evidently of this character; although as pointed out by Adami these reactions may be inadequate, and fail to accomplish their end in that they are insufficiently exhibited or on the other hand may themselves by their excess do positive harm to the tissues.

It would appear therefore that in our conceptions of disease the profession have erred in the past in divorcing too sharply normal physiological activities from definitely pathological reaction. Many of the phenomena which are exhibited during the course of disease more particularly those due to infection by micro-organisms or to the action of their toxins, when closely investigated will be found to be physiological reactions which nature holds in reserve; an appreciation of this fact will often enable us to appraise more correctly the value of such phenomena and to decide on their proper scientific treatment.

One of the most frequently encountered of these phenomena due to disease is that of fever. Its importance as a symptom has been realized at least since the time of Hippocrates, and during all these past ages it has been regarded by the profession as an essentially harmful manifestation of disease. The many clinical procedures such as cold packs, baths, and the use of numerous antipyretic drugs, indicate how wide-spread and tenaciously held this view of fever has been. That upon occasion hyperpyrexia may be the cause of injury to the tissues and even a direct cause of death there can be no denying. On the other hand numerous experiments have shown that in infectious conditions a certain degree of pyrexia is certainly beneficial. The experiments of Rolley and Meltzer in which animals kept at moderate fever heat were able to withstand infections fatal to controls kept at normal temperature, are evidence of this fact.

Very recently an interesting series of experiments carried out chiefly upon the author himself has been published by Dr. Oliver Heath. Dr. Heath's experiments were made in an effort to obtain evidence which might be of assistance in explaining the causation of fever. As a means of producing fever in himself he chose the subcutaneous injection of typhoid vaccine. By the use of this method he was able to determine accurately the number of bacilli operating, and he took advantage of the fact which appears to have been adequately proven, that living and killed cultures of bacteria produce almost identical elevations in temperature. After determining the normal bactericidal power of the blood against the typhoid bacillus he was able to make comparative charts showing the relative increase or decrease in the bactericidal power of the blood after various procedures. It is interesting to note that when the agglutinating effect of each sample of serum was tested the bactericidal and agglutinating effects were found to vary in the same direction.

Dr. Heath believes that his experiments prove that fever associated with bacterial infection is due to the inactivation of the antibody in the blood by the bacteria in the tissues; also that the temperature rises as the proportion of antibody inactivated to the total antibody content increases; and the severity of symptoms increases as the amount of antibody falls toward zero.

Dr. Heath's experiments appear to prove unquestionably that with a rise in temperature following the injection of typhoid bacilli there is a corresponding diminution in the amount of circulating antibody in the blood. That it is this loss in antibody however which is responsible for fever appears to us as not proven He states that probably the bacteria-antibody complex is neutral and inoccuous. If there were any proof that this is the case support would be lent to his contentions. There is however no proof of this sort. On the other hand there are many experiments to show that the result of the reaction between antibody and antigen (bacterial cell body) is in fact a definite irritant to the tissues and that it is this irritant product of the antigen-antibody reaction which is the cause of fever.

Heath reports experiments which seem to show that if the dose injected always bears the same proportion to the total immunity whatever that immunity may be, the resulting temperature will be the same, and since with similar absorption time any dose must cause a relatively proportional fall in the amount of antibody in the blood his experiments would appear to warrant us in saying that the rise of temperature depends exactly on the proportion which the fall in the blood titre bears to the total immunity.

Although we are not prepared to admit Dr. Heath's contentions in their entirety we are of the opinion that his experiments constitute a definite contribution to immunological science. We believe also that the practical conclusions which he draws from his experiments are sound. He believes that the altered circulating blood acting on the nerve centres excites impulses which (1) inhibit normal activities and free energy for defence; (2) in place of these there start normal defence processes which (*a*) form fresh antibody and (*b*) raise the temperature to accelerate this process; (3) where specific immunity is exhibited this enables the patient to use his energy in greater comfort and more economical fashion and increases the efficiency of the blood fluids as destroyers of bacteria.

We are also in entire agreement with him in his condemnation of antipyretic drugs and measures when used for the sole purpose of lowering temperature, excepting under those circumstances when the temperature rises to such a height that it becomes of itself definitely dangerous to life.

F. B. GURD

THE RESULT OF TONSILLECTOMY ON THE HEALTH OF CHILDREN

THREE years ago after a survey of all the school children of Rochester, N.Y., it was determined that all those who showed any diseased condition of the tonsils should have, if permission was given by their parents, their tonsils excised, the community chest of the Rochester Charitable Organization financing the work. Eight thousand children were operated upon in fourteen weeks without any fatal result. Two years ago a report was made on the condition of 5,000 children who had been operated upon at that time. The encouraging results then given were reported in our *Journal*. This year a smaller group of 1,200 children representing an unselected series of the large number operated upon were again examined, and their history and condition since the operation was compared with that of 1,200 other children who had not been operated upon. Three factors were considered; (1) the relative presence or absence of subjective symptoms referable to the throat; (2) the relative incidence of infection; and (3) the relative state of nutrition. In a paper presented before the section of Diseases of Children at the recent annual meeting of the American Medical Association Dr. Albert D. Kaiser read a report giving the results of this investigation. He states that after a review of all the data obtained one is impressed with the absence of any spectacular results in comparing the group of children operated upon with a similar group of children not operated upon. The striking improvement that is often witnessed in a child's general health following this operation when definite conditions exist which demand it fails to be so evident in a group in which a selection is not made. It is universally conceded that an operation removing a diseased focus will bring about a favourable result and be of permanent benefit to the child. There has also been no doubt as to the value of the operation in extreme cases with marked obstruction of the respiratory tract. In the vast majority of children, however, the indications for operation are not so positive. Many years must undoubtedly elapse before the ultimate effect of the operation upon a child can be definitely determined, but this report presented after a period of three years on a group of 1,200 children operated upon, in whom the health history is compared with that of an equal number of children about the same age and living under the same circumstances in whom the operation was refused by their parents, must certainly have considerable value. Dr. Kaiser's conclusions are as follows: (1) Tonsillectomy offers a child considerable relief from such common complaints as sore throat, head cold and mouth breathing. (2) It lessens the chances of having discharging ears and their complications. (3) It assures some protection against glandular infection, but is no guarantee against it, and it does not assure the immediate disappearance of large cervical glands. (4) It does not appear to influence to any extent, infections of the larynx, bronchi and lungs, as they appear to have occurred equally in both groups. (5) It does not prevent scarlet fever or measles, but may influence the severity of the infection. (6) It seems to lessen the incidence of diphtheria by removing fertile soil for the diphtheria bacillus. (7) It has not influenced the incidence of chorea or rheumatism. (8) It has shown a lessened incidence of heart disease over a period of three years. (9) It has definitely improved nutrition in the group operated upon as compared with the group that was not operated upon.

Against this very moderate statement of improvement in a child's general nutrition, and in its power of resisting infection must be placed the dangers of the surgical operation, and of the complications that may ensue.

REGENERATION OF CELLS OF PANCREAS UNDER USE OF INSULIN

WE are glad to notice that a case of diabetes has recently been reported in which not only has improvement in the tolerance to carbohydrates been observed clinically, but also definite evidence of regeneration in the pancreas has been noted post-mortem. At the recent meeting of the Canadian Society for the Study of Diseases of Children, Dr. Gladys Boyd and Dr. W. L. Robinson reported the case of a boy eight years old who had had diabetes for six years. He had from the first been treated wisely and did well on a strict diet for a few years until as a result of frequent infections his tolerance was decreased to ten grammes of carbohydrate. In this condition he was admitted to the Hospital for Sick Children, Toronto, January, 1923. He was then in appearance an emaciated dwarf, more or less drowsy and very irritable. Insulin combined with an adequate diet was given at once and during the following year his carbohydrate tolerance was trebled, and his weight was doubled. To all intents he appeared to be a healthy well nourished boy. While sliding with some companions he met with an accident, his skull was fractured, and he died in three hours. An immediate post-mortem was done and the pancreas was at once examined. Macroscopically, it was of good average weight for the size and age of the patient, and presented no abnormality to the eye. Examined under the microscope the degenerative changes usually associated with diabetes were almost entirely lacking as were also any interlobular, fibrotic or hyaline changes. The whole pancreas was studded with islands in all stages of maturity; many of them containing more than the usual proportion of the supposedly antidiabetic B. cells. The proliferation of centro-acinar and duct cells was striking. We trust that we may be able to report many more similar instances in which extensive regeneration may be shown to have taken place under the use of insulin.

THE DISCOVERY OF THE ORGANISM OF FOOT AND MOUTH DISEASE

OVER a year ago Frosch, Professor of Bacteriology in the Royal Veterinary College at Berlin, published some observations on the morphology of the organism of bovine pleuro-pneumonia. This organism is just on the limit of visibility, and can be seen in suitable circumstances as a tiny refractile granule. Using ultra-visible rays and by the use of a projection apparatus he was able to photograph and more fully describe it. In a recent number of the *British Medical Journal* the statement is made that he has now been able by means of the same instrument to photograph the organism of foot and mouth disease. It is a very minute bacillus, ovoid in outline, and usually diploid. He was able to demonstrate it in cultures as well as in the vesicular fluid. Cultures were prepared by Dahmen from foot and mouth disease lymph. The lymph was inoculated into the foot of a guinea pig and cultures were made from the resulting vesicles. By a process not yet described he was able to filter the virus from this fluid. Most of the liquid culture media were found to be unsuitable. He then used certain solid media, the composition of which is also kept secret. The cultures were incubated at 30° to 37° C., and on the seventh day small elevated spots about the size of a red blood corpuscle were seen. At this stage the bacillus was sub-cultured. It is stated that these cultures have been maintained over ten months (some 25

generations) and the organism has still retained its virulence although this is definitely modified. Transmission experiments were performed on guinea pigs using cultures of the 5th., 13th., and 23rd. generations. After inoculation slight redness was observed at the site of injection only and the disease remained localized. Cattle are now being experimented on, but the results are not yet available. At a demonstration on April 7th., Frosch and Dahmen stated that the German Department of Health and the Robert Koch Institute were conducting confirmatory tests, and three weeks later they reported that their results had been confirmed by both these institutions. They expressed regret that the German Ministry of Agriculture had not yet given them permission to publish the details.

CONTAGIOUS DISEASES OF CHILDHOOD

DR. CHARLES HERRMAN, in the *New York State Journal of Medicine*, Feb. 29th, 1924, in an article on the Cause and Prevention of the Contagious Diseases of Childhood," writes on the marked alteration in scientific opinion concerning the communicability of infectious diseases and the methods essential for their isolation and sanitary control. He accepts the principle that communicable diseases are usually spread *by direct contact* with persons having the disease, either in a definite and distinct or in an atypical form, or by carriers who are unwittingly disseminators. Health officers no longer become excited over the disinfection of clothes, rooms and foodstuffs but rest content with the idea that soap and water, and abundant fresh air and sunlight will restore the contaminated atmosphere to a condition of safe respirability. The necessity for prolonged isolation is passing away with the better understanding of the nature of infections and their methods of spread through a community. More emphasis is now placed on the development of prophylactic measures that will decrease the susceptibility to infection.

Our ability to control many of our contagious diseases is limited by the presence of a considerable number of unrecognized mild and atypical infections and by the presence of numerous carriers; but most of all by the fact that many infectious diseases are most communicable during the early period when their true nature is not recognized. Our most effective method of controlling the communicable diseases must in the future be to insist on immunizing methods. The difficulty at present is that childhood is the period of greatest susceptibility to contagious diseases, and parents at the present are unwilling to submit their children to methods and procedures concerning whose merits there appears room for argument. The profession should recognize and appreciate this attitude of the general public. Immunizing methods will be accepted only slowly in most communities; and chiefly through the gradual extension of facilities for immunizing under the auspices of hospitals, welfare stations, and health centres, whose influence should be to develop confidence; such preventive methods should also receive the enthusiastic support of the family physician and the profession generally.

THE AMMONIA OF THE URINE

THOSE who find it difficult to grasp the technical details of metabolism are always grateful for those periodical pauses in research when the laboratory worker gathers up threads in a pattern whose design is so far only dimly and partially traceable. One such pattern is the functioning of the kidney, and one

such pause has been made by Dr. I. M. Rabinovitch in his researches in metabolism at the Montreal General Hospital*. His work substantiates what has been to some extent a hypothesis, namely, that the ammonia in the urine is produced by the kidney itself; it is not drawn from ammonia existing in the blood. This work explains the clinical observation that diabetics with nephritis are more likely to have acidosis than diabetics with healthy kidneys.

This newly ascertained fact helps us to still further appreciate how complex are the functions of the kidney, especially in the regulation of the system's metabolic activities; knowledge of it may also be of practical value in aiding us in our treatment of problems where additional guiding facts are very welcome. H. E. M.

*The Origin of Ammonia in the Urine: *Canadian Medical Association Journal*, October, 1923.
The Origin of Urinary Ammonia: *Arch. of Int. Med.*, March, 1924.

ARE BACTERIA ANIMALS OR PLANTS?

THERE have been from time to time many discussions as to whether bacteria belong to the animal or vegetable kingdom. A biologist no less eminent than Haeckel proposed to create a new classification and make these low forms of life into a new division, to be termed *Protista*. The opinion of the majority of biologists at present is to assign these microorganisms to the plant world, a decision based largely on their spore formation and chemosynthesis, both recognized characteristics of the vegetable world. Bacteria resemble some of the algae in form, in mode of reproduction and in the absence of a definite nucleus, yet those which possess flagella show points of resemblance with some of the protozoa. The *Journal of the American Medical Association*, from which we abstract some of the above statements, quotes E. R. Long of the Sprague Memorial Institute in Chicago, who writes that a useful purpose is served by the effort to fit all living beings into the one or other class so far as the evolutionary point of view is maintained. In his investigations of bacteria to find evidence to further their proper classification, Long has sought for chemical criteria and states that the tubercle bacillus, the best studied of the microorganisms contains a typical nucleic acid of the animal type, probably identical with that found in the thymus, pancreas, sperm and spleen. It does not contain any nucleic acid of the known plant types. On the other hand, bacteria resemble plants chemically in their possession of marked chemosynthetic power in nitrogen metabolism, leading to the production of such complex compounds as amino-acids and purins, apparently from ammonia. Other conflicting though less chemical testimony might be given. Certainly, more evidence must be forthcoming before a final decision can be made. We have much to learn, Long writes, but he adds, in the meantime it is to the credit of those who are investigating the subject that they have put on record additions to our knowledge of the tubercle bacillus more numerous than have been recorded for any other bacterium.

Studies on the Metabolism of Obesity.—Observations made by Solomon Strouse, Chi Che Wang, Chicago, and Marie Dye, East Lansing, Mich., have shown that (1) obesity in certain persons may occur on food intakes much below their calculated caloric requirements; (2) the basal metabolism in obesity does not differ from the normal; (3) the specific dynamic action of protein is decidedly less marked in the obese than in the normal, and (4) there probably exists an anomaly of fat metabolism in the obese, the exact nature of which has not been ascertained.—*Jour. Am. Med. Ass.*, June 28, 1924.

Editorial Comments

THE WORK OF THE ROCKEFELLER FOUNDATION FOR 1923

An account of the activities of the Rockefeller Foundation for 1923 is given in a recent publication issued under the title "A Review for 1923," by the President of the Foundation, Dr. George E. Vincent. A summary of the activities and achievements of the Foundation for the first ten years of its existence—up to the end of 1922—appeared in an editorial in this *Journal* in the July issue of last year, and we shall now refer only to the progress of its work for 1923. The principal funds, general and special, in other words the endowment of the Foundation, amount to $165,291,624; the income from which for the year was $8,822,879, which with a balance from 1922 and certain refunds made a total of $15,135,579 available for disbursements. Of this, $3,174,268 were spent in Public Health, $4,911,010 for Medical Education, and for Administration $189,869, the last a remarkably low figure, only about 1.25 per cent. of the total involved. The amount undisbursed for the year was $6,704,504; this was reserved to pay appropriations made before 1923 and for a number of years to follow. The Foundation is apparently able to finance generously its numerous projects and maintain its large endowment.

The record of work for the year is a long one. The projects undertaken and supported during the earlier years were carried on in some instances on a larger scale. The campaign against malaria in the United States, Central America, Brazil, Australia, the Philippine Islands, and Palestine, was continued, as was also that against the hookworm in conjunction with 20 governments in various parts of the world. The Foundation co-operated with the Brazilian Government to make a systematic attack on yellow fever which so far as the western hemisphere is concerned is now limited in its incidence to a few spots, "the seed beds" of the disease, on the coast from Para to Bahia and at Bogota in Colombia. The attack on the disease on the west coast of Africa, where cases of yellow fever have been reported, is also projected. The limitation of the disease to these centres, from a prevalence, of forty years ago, over the West Indies, on the southern littoral of the United States, the east and west coasts of Mexico and Central America, and on the east and west coasts of South America as far south as 25 degrees below the equator, encourages the hope that it will, with ankylostomiasis and malaria, become in a generation so rare that patients manifesting it will be curiosities, not as now almost commonplaces, to medical science in the tropics and subtropics. With the discovery of the microorganism causing the disease and of a vaccine and a serum for it by Noguchi, a member of the staff of the Rockefeller Institute—*be it noted, a Japanese*—the complete conquest of the disease is only a matter of a very few years. In organizing and coordinating the agencies under governmental and private auspices for the control of these diseases the Foundation is performing a service that will hasten the desired result.

The Foundation exercises activities in other fields which will involve years of stress and labour before its work will be finished—if it ever will be. These concern public health, medical education, and the premedical sciences. It has given generously for the establishment of Institutes of Hygiene at Harvard, London, Prague, Warsaw and Sao Paulo, Brazil, and it supports the health section of the League of Nations. It has encouraged, and liberally supported financially, surveys and studies of systems of nursing in the United States and twelve foreign countries, it has aided in the demonstration of newer methods of training and given contributions to projects which aim at improving general training courses and special courses for public health nurses. These were carried out in Brazil, France, the Philippine Islands, China, and Ohio. Fellowships were given to send French and Belgian nurses to England, and French, Polish, Czecho-Slovakian and Philippine nurses to America for further training in nursing. It is a "far cry" from the time of the sainted "Lady with the lamp" of the hospital at Scutari, but nursing has not yet come to its own. The aim is to raise the

status of the profession throughout the world and thus to give it a prestige that will attract recruits of character who will count in the crusade to promote to the utmost public health everywhere.

Of the efforts of the Foundation to raise the standard of medical education more is generally known. Besides what it has already given to various medical schools throughout the world it has commitments outside of those, which are for support of its more or less permanent undertakings, totalling, for the next five years, $20,718,783. It is inevitable that during that period similar large sums will be pledged for new projects in this line.

The work undertaken by the China Medical Board promises eventually to give results which will have a far-reaching effect. In a population of four hundred million, a fourth of the human race, western medicine once firmly established will alter the whole outlook of the race and the generous support accorded to the Peking Union Medical College and to other medical schools as well as to hospitals under western auspices, will greatly contribute to that end. Already the staff of the college is making a reputation for it, not only as a splendid teaching organization but also as an important centre in the Far East for research in medical science.

To safeguard the succession of scientific men in Europe, the Foundation, in the interest primarily of modern medicine, in 1923 awarded 194 Fellowships to specially selected promising young workers in Germany who would otherwise be unable to prepare for a career in scientific medicine because of the impoverishment of the German universities, which has threatened to eclipse German scientific research, so potent a factor in the development of our knowledge and treatment of disease during the last seventy years. The Foundation is extending this assistance to other countries in Europe in which the universities have been similarly handicapped. It has appropriated funds for laboratory supplies and also literature for university medical faculties in Central Europe in whose libraries there were gaps, in some cases covering five years, in the files of medical journals published elsewhere. This was a serious handicap to research and the assistance given, extended as it was to 271 medical libraries in fifteen countries of Europe, placed them in immediate touch with abroad and insured a continuity in productive research that, without such aid, would have been impossible.

The cardinal idea behind all the aims of the Foundation is the development of preventive medicine. To this end premedical and medical courses everywhere must be abreast, not only of scientific progress but of the needs of the day and above all those who are to be concerned in the promotion of public health should be specially trained for it. As Dr. Vincent puts it, "the fundamental need in the progress of preventive medicine is a specialized personnel thoroughly grounded in the underlying sciences and familiar with the best methods of practical application and administration. The idea that an ordinary medical education fits a doctor to be a health officer is a serious error which does much harm. He needs additional graduate training for what is regarded as a special profession." After the immediate object of improving the premedical and medical courses throughout the world has been to a considerable degree met there will still remain, for many years, the realization of the ideal in preventive medicine, the fundamental factor in the promotion of "the well-being of mankind throughout the world," the purpose of the Foundation, according to its Charter. That will ultimately engage all its resources and on its success will depend the welfare of countless millions yet unborn.

It is evident that the Trustees of the Foundation have had to meet the importunities of many "pipe-dreamers," overzealous enthusiasts and others of that ilk—all well-intentioned, of course. In 1922 they received 835 applications for aid, of which only 42 were favourably entertained, while there were 809 declined in 1923. Many of these were for the building or maintenance of churches, hospitals (in connection with educational programmes), or other local institutions, or to support campaigns to influence public opinion on social or political questions and for other projects outside of the aims of the Foundation. There are apparently not a few who seem to think that the Foundation has the purse of Fortunatus.

We have dealt, and all to briefly, with only a few of the activities of the Foundation as

described by its President. "The Review," as it appears annually, should be read by everyone who desires to know what is being done to improve medical education and to put public health on a secure, scientific basis.

THE USE OF SODIUM CHLORIDE IN THE TREATMENT OF INTESTINAL OBSTRUCTION

If obstruction occurs high up in the intestine there are symptoms of rapid and acute poisoning. This has been amply proved by experimental work, and has quite thoroughly been realized clinically. But it is another matter exactly to define the source and nature of the poison at work. It is not for lack of inquiry, however, that such uncertainty exists, and an excellent example of combined experimental and clinical research in the matter is now at hand.* We know that obstruction of the upper intestinal tract will give almost invariable changes in some of the chemical constituents of the blood: the chlorides of the plasma are very much diminished; the urea in the blood increases; and the capacity of the blood for carrying carbon dioxide is also increased. Of these changes it is the disappearance of the chlorides from the blood which seems to be the most fundamental, although the metabolism underlying the change is not clear. There is an accompanying diminution in the chloride excretion in the urine; that vomiting does not account for the loss is shown in the case of rabbits, which cannot vomit and yet show the same decrease; and in one patient also the usual diminution occurred without any associated vomiting.

Therefore, there is good reason to base the treatment of this toxæmia on the replacement of the chlorides. Drs. Haden and Orr have been able to greatly prolong life in dogs with experimentally produced obstruction of the duodenum, by giving them daily hypodermic injections of physiological sodium chloride. Such dogs lived for twenty-eight days from the onset of the obstruction, whilst control animals which were given distilled water, only lived four days. These workers were guided by these results in the treatment of two cases of intestinal obstruction, and found that the administration of sodium chloride caused improvement of symptoms, with well marked readjustment of the chemical disturbances in the blood. They feel that the chlorides "act as a protecting agent in intestinal obstruction by reducing, in some manner, the toxæmia."

Dr. Dixon reports six cases of duodenal obstruction from the Mayo Clinic, in whom the treatment was guided by similar reasoning. The mortality in the untreated cases showed, when compared with the treated, that preoperative measures of this nature undoubtedly lowered the risk. And this is in a type of case in which the mortality equals or exceeds that of almost any other acute surgical condition. The treatment also decreases or abolishes the toxæmia of the same kind often seen in patients with functional stasis alone.

Further work will probably give us a clearer understanding in the matter, but even now there seems to be little doubt that in these extremely grave conditions we may avail ourselves of a measure whose simplicity is by no means its least advantage.

H. E. M.

*Use of Sodium Chloride in treatment of Intestinal Obstruction. Russell L. Haden, M.D., and Thomas G. Orr, M.D., Kansas City, Kan. *J.A.M.A.*, May 10th, 1924.
The Value of Sodium Chloride in the Treatment of Duodenal Intoxication, Claude F. Dixon, Rochester, Minn. *Ibid.*

THE VALUE OF CONDENSED COWS' MILK IN THE TROPICS

We are in receipt from Dr. Deeks of the United Fruit Company, New York, of a reprint of an interesting pamphlet on the "Value of Condensed Cows' Milk in the Tropics," where many difficulties are encountered in any attempt to obtain fresh cows' milk for infant feeding. The quality of grass in the tropics does not supply a good grade of milk, and to make it satisfactory the animals must have the addition of an imported food, which is as a rule expensive and difficult to obtain, and the improved quality and quantity of the milk does not reward one adequately for the extra expense. Moreover the people in these tropical countries are not yet sufficiently educated to enable them to realize the necessity of absolute cleanliness in the milking and in the transportation of milk, while the continual warm weather favours bacterial growth. Under these circumstances various forms of condensed and powdered milk form a very serviceable substitute for infants and young children. Although

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these prepared milks are deficient in fats and in antiscorbutic properties, Dr. Deeks presents suitable formula for the preparation of satisfactory infant food. The fats may be to some extent supplied by the addition of carbohydrates, while the antiscorbutic properties are supplied by the use of orange juice or tomato juice. From the statistics given by Dr. Deeks the success of these milks in the tropics is notable.

COMPARATIVE PATHOLOGY

In an address entitled "Some Biological and Economic Aspects of Comparative Pathology", which was delivered at the centenary celebration of the Royal Veterinary College, of Edinburgh, and published in the April number of the *Edinburgh Medical Journal*, Dr. Theobald Smith has summed up in a broad way the scope, aims and needs of this division of the biological sciences. Many of the points brought out apply as well to that more specific branch, human pathology.

The value of animals for experimental purposes has long been recognized, but the insight into human disease which can be gained by the careful study of similar conditions in various species where the progress of the lesion may be observed by autopsies at different stages, has not been sufficiently appreciated. Moreover, there are many diseases of man, now incompletely understood, in which some particular animal species acts either as a specific carrier or serves as an intermediate host for the completion of the life-cycle of the parasite. Can the comparative pathologist but complete his part of the problem, then the eradication of the disease can be put upon a firm scientific basis.

Dr. Smith compares disease and pathological studies to two trains running side by side along parallel tracks. Both are moving rapidly but if the speeds are equal, they are at a standstill as regards each other. We must so accelerate our progress by diligent research as to get ahead and sufficiently ahead to be prepared to sidetrack the oncoming disease. He calls attention to the fact that while in medicine we are concerned with the life of the individual, with animals the economic aspects hold first sway. One is inclined to look into the future and wonder, in view of the ever increasing population of the earth and the urban congestion, how long this purely humanitarian principle can prevail.

METHOD OF TRANSMISSION OF THE PLAGUE BACILLUS TO MAN

Lieutenant-Colonel Glen Liston in his Milroy lectures delivered recently at London makes the following interesting statements on the transmission of the plague bacillus by fleas. "Early in my work on fleas I made serial sections of them and found that some of them which had fed on a plague-infected rat showed numerous plague-like bacilli in the œsophagus and in a valvular organ which is sometimes called the gizzard situated immediately in front of the stomach. Elkinton, who was a co-worker with me, refers to my sections as follows: 'These sections were stained and mounted in the usual manner and it was found that after a meal of infected blood the bacilli were for the greater part retained in a curious straining organ, gizzard-like in structure between the œsophagus and the stomach. Control specimens fed upon healthy rats show no bacilli in this organ, whereas in fleas fed upon plague-stricken rats large numbers of bacilli resembling the plague organism were seen in this organ. These bacilli appeared to remain in this structure which has been termed a straining organ after the blood had been digested in the stomach and were found as long as eighty-four hours after a meal. It remained for Martin and Bacot to prove the full significance of the appearance noted in these sections, by observing infected fleas feeding upon a healthy animal through a magnifying lens; and they succeeded in showing that infection could be brought about by the bites alone. During the course of these experiments they noted that whereas certain fleas on plague-infected rats sucked energetically and persistently, yet no blood appeared to enter their stomachs, but the œsophagus became unusually distinct. On dissecting these fleas it was discovered that the gizzards or proventriculi were blocked with what appeared to be almost a solid culture of plague bacilli. They explain that in fleas with the proventriculi obstructed in this manner, blood cannot find its way into the stomach but this does not prevent the insect sucking although it only distends the œsophagus, and they have seen drops of blood escape from the mouth parts of these blocked fleas when the insects withdrew their probosces. This appears to be the common way in which infection is transmitted by fleas. This anatomical construction of the proventriculus allowing of the development of a blocked condition in plague-infected fleas distinguishes these in-

sects from other common blood sucking insects such as bugs, lice, or mosquitoes. Colonel Liston closes his very interesting lectures with the following statement: "The modern study of bubonic plague has shown that the disease is essentially one of rodents; that men become infected from these animals by living in propinquity to them, that the plague bacilli which are the cause of the disease are transmitted from rodents to men by the instrumentality of the fleas which on account of their anatomical structure are liable to develop a peculiar pathological condition which allows the injection of the plague bacillus under the skin when certain species of rodent fleas feed upon men after feeding upon plague-infected animals. Fleas and fleas alone are the transmitting agents of infection."

We congratulate the Metropolitan Life Insurance Company on its Statistical Bulletin which certainly must be of great value to all our health officers and through them to the public. In the April number we note that, in speaking of the deaths from tuberculosis it states that those cities and provinces which have the most favourable death rate for all combined causes are also those which have a relatively low mortality from tuberculosis. We are pleased to note that it adds that the western provinces of Canada have far and away the lowest death rates among the industrial populations, both for tuberculosis and for all other diseases. The west North Central States have the next best record, while the east South Central, West South Central and South Atlantic States have high general death rates and high tuberculosis mortality. The regional distribution of tuberculosis presents an interesting picture. The industrial populations of the cities show higher tuberculosis rates, for the most part below the Mason and Dixon line. In the South Atlantic group, Delaware is the only one of eight states whose industrial population death rate is below that for the whole country. The most fertile field for an anti-tuberculosis movement in America, according to this Bulletin, now lies among the urban wage workers of the South Atlantic, east South Central states and Louisiana.

At and after each and every annual meeting are heard many opinions expressing destructive or constructive criticism.

As a rule these never see the light as they are verbal and are usually made to an official or Committee man harassed by the hurry of the moment and the attempt to be in two places at once.

The Executive at its last meeting in Ottawa resolved, therefore, that in the interests of the Association and to benefit the organization of future meetings all members should be asked to express an opinion, to criticize any detail coming under their preview and above all to suggest an alternative method.

It is the desire of the Executive to make the annual meeting profitable as well as pleasurable to each and every member, always retaining the idea of providing the greatest good to the greatest number.

Will our readers therefore accept this invitation and address all communications to the General Secretary, Dr. Routley, who in turn will tabulate them and bring them before the Executive Committee.

Edema of the Eyelids.—S. Judd Beach, Portland, Maine, reports two cases of severe edema of the eyelids. In one case, there was symmetrical swelling of the lower lids and cheeks, somewhat reminiscent of mumps. It was marked just below the zygoma, but on palpation appeared not to involve the parotid. There was no tenderness. The conjunctiva was normal, and the tear ducts patent to collyria. On further examination, the patient was found to be afflicted with paratyphoid fever. Beach sees a relationship between the paratyphoid fever and the edema. An identical attack of fever ushered in by swelling of the face was said to have occurred just previously in the same household. It is possible that this episode explains those mysterious epidemics of edema of the face with typhoid symptoms and negative Widal reaction, like that reported by Elgood. In the second case, the edema was associated with sinus infection.—*Jour. Am. Med. Ass.*, July 5, 1924.

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Medical Societies

THE ANNUAL MEETING OF THE CANADIAN AND ONTARIO MEDICAL ASSOCIATIONS

The large membership, the overflowing hospitality of the citizens, the fine weather, the profusion of flowers and the excellent facilities on one side of the river for the scientific functions, and on the other for social gatherings, all these combined to make this meeting a very enjoyable and profitable one for both associations.

The new Ottawa Glebe Collegiate Institute provided good accommodation, and what is not always found, quietude from noisy traffic. The auditorium furnished a stage and ample seating capacity for the general sessions, and the various classrooms proved suitable for many of the sections, although at times both the medical and surgical sections found their rooms too small for the numbers that attended. The collection of exhibits was large and varied, and appeared to be a constant source of interest. A recent addition to the multitude of surgical appliances was the radio knife which at all times attracted much attention. Briefly described it may be said to consist of an ordinary steel needle resembling a sewing needle held at right angles by an adjustable handle and heated by an alternating current with oscillations running into the hundreds of thousands per second. A circle of needle pricks of adequate depth is made round the morbid mass arresting hæmorrhage by coagulation. The needle is then used as a knife to excise the tumour. It is claimed that no anæsthetic is required. The very high number of oscillations per second inhibiting any effect on either motor or sensory nerves.

At the first session the Mayor extended a most cordial greeting to the members, and the Minister of Public Works brought kindly greetings from Parliament. The Round Table Dinner discussion on the 17th. at the Chateau Laurier was well attended, and many interesting subjects were discussed. The official banquet was held on the 19th., and addresses were given by Sir Robert Borden, Sir Jenner Verral, and Dr. Cox, secretary of the British Medical Association. The two latter came as delegates from the British Association to offer to the Canadian Medical Association a more or less sentimental bond of union; a marriage bond, it was termed between the two Associations, with the word "obey" in the ceremony left out. The bond was duly confirmed and it is to be hoped that the British and the Canadian Associations may find their conjugal life a happy and a useful one.

The scientific work of the meeting was carried on in the morning sessions at the various sectional meetings, and in the afternoon combined meetings of all the sections were addressed by prominent members of the profession on subjects of general interest.

Sir John Thomson-Walker, of London, gave an address on "*Some views of prostatectomy*", and held the interested attention of his large audience by his personality, and by the clarity of the diction in which he stated the conclusions he had arrived at from an unusually large experience.

Dr. Chevalier Jackson was unfortunately too ill to attend himself, but sent a very competent member of his staff to present a paper on "*Bronchoscopic and Oesophagoscopic Cases, medical and surgical*" which was well illustrated. The salvage which had been reclaimed from the respiratory and digestive tracts made a most amazing exhibition. The safety pin headed the list, but the array of buttons, nails, toys and false teeth was a very formidable one.

Dr. John Parkinson, of London, on the afternoon of the sceond day, presented a very thoughtful paper on "*The diagnosis of a healthy heart*", emphasizing the importance of a past history of either acute rheumatism or syphilis when deciding that a heart was organically diseased and claiming for the majority of cases of disordered heart action a functional significance only. This valuable paper will appear in full in our next issue.

Dr. Joslin, of Boston, made a valuable contribution to the subject of Diabetes, and to the many problems in this disease which still demand solution. He paid a well merited tribute to the discovery of Banting and his *confrères* and said that the value of Banting's work would not be confined merely to the relief of the diabetic patient but would reverberate through the decade and inspire fresh effort in every sphere of scientific investigation. Men and especially young

men throughout the world would be stimulated by his epoch making achievement and further discoveries will certainly follow as the result of this inspiration.

Dr. Polak, of New York, read a thought-stimulating paper on the "Effect of several of the common gynæcological operations on future child-bearing in women." Many of the operations permitted in past gynæcological practice were severely criticized especially operations on the cervix of the uterus. Pictorial illustrations were given to show the great value of posture; especially the primeval form of walking on hands and feet to relieve symptoms of retroversion and to adjust vascular conditions in the pelvis.

In the various sectional meetings held during the morning sessions, many valuable papers were read and discussed. On Friday immediately after luncheon a business session of the Association was held at which the secretary presented the final report of business transacted. At this meeting a hearty vote of thanks was tendered the Ottawa Medico-Chirurgical society for carrying out one of the most successful medical conventions ever held in Canada. Regina was chosen as the next place of meeting. The following is a list of the newly elected officers of the two associations for the year 1924-25:—

Canadian Medical Association: President—Dr. David Low, Regina, Sask.; Editor—Dr. A. D. Blackader, Montreal; Hon. Treasurer and Managing Editor—Dr. A. T. Bazin, Montreal; Chairman of Council—Dr. Alex. Primrose, Toronto; Chairman of Executive—Dr. W. G. Reilly, Montreal; General Secretary—Dr. T. C. Routley, 184 College St., Toronto.

Ontario Medical Association: President—Dr. George S. Young, Toronto; 1st Vice President—Dr. John Macgregor, London; 2nd. Vice President—Dr. Edgar Brandon, North Bay; Hon. Treasurer—Dr. G. Stewart Cameron, Peterborough; General Secretary—Dr. T. C. Routley, 184 College St., Toronto. Counsellors—District No. 1—Dr. A. J. Grant, London; District No. 2—Dr. Weston Krupp, Woodstock; District No. 3—Dr. T. H. Middlebro, Owen Sound; District No. 4—Dr. J. H. Holbrook, Hamilton; District No. 5—Dr. Robert T. Noble, Toronto; District No. 6—Dr. E. A. McQuade, Trenton; District No. 7—Dr. L. J. Austin, Kingston; District No. 8—Dr. H. B. Moffatt, Ottawa; District No. 9—Dr. W. J. Cook, Sudbury; District No. 10—Dr. John I. Pratt, Port Arthur. JOHN HUNTER

THE SURGICAL SECTION

The surgical section convened on the forenoons of the first and second days of the meeting. Dr. D. T. Smith presided, with Dr. H. B. Moffatt as Secretary. The programme committee had selected six important topics for discussion, three for each session, and had arranged for designated speakers to open the discussion after each paper. Certain criticisms may be here offered. The first is that the room in which the section met was decidedly too small to accommodate the numbers attracted by the programme. The second criticism is that in order to conform to the time table the chairman was unable to permit of general discussion except in one or two instances. The last is that too frequently the individual named to open the discussion unfortunately read a presentation of a quite different phase of the subject, in fact, a paper not relevant to the first. It would in our opinion have been better and would have elicited more interest if the discussion had been limited to the phase of the subject presented by the principal speaker.

Inasmuch as the majority of the papers will be published in a later issue of this *Journal* no attempt will be made to report the proceedings other than to outline as far as possible the principal thoughts conveyed by each speaker. In discussing the diagnosis and treatment of "Chronic Ulcers of the Leg", Dr. R. E. Gaby, of Toronto, emphasized the necessity of stimulating so far as may be possible the repair processes, and described the method of treatment both in ambulatory patients and in those confined to bed. Dr. Omer Wilson gave an interesting demonstration by means of lantern slides of the many superficial lesions of the lower extremities, and Dr. Klotz presented their pathological aspect, and emphasized the importance before commencing treatment, of deciding whether the ulcer was due to infection or to a disturbance in nutrition.

After first protesting against the use of the term "The Acute Abdomen", Dr. Primrose, of Toronto, presented an interesting paper on the theme as stated in the programme, "*Surgical problems of the acute abdomen.*" He discussed in detail the nerve supply of the peritoneum and of the viscera, and the importance of correctly interpreting pain and hypersensibility referred from an infected organ to its related superficial or skin area.

Dr. St. Jacques, of Montreal, called attention

to cases of *"hypertoxic appendicitis"*, and the necessity of differentiating such cases from those of acute infective enteritis.

Dr. Mowbray, of Hamilton, confined his remarks chiefly to a discussion of the symptoms of an acute perforation of a hollow viscera in the upper abdomen.

"Acute bone lesions" was the subject of a paper presented by Dr. Clarence Starr who illustrated the origin and spread of acute osteomyelitis in a series of lantern slides. He emphasized the view that the infection tends to spread from the metaphysis to the surface, rather than to the central canal of the long bones; hence the advisability of incising the periosteum and drilling in to the seat of origin rather than into the bone marrow. When the bone marrow is infected he considered that it became so secondarily and that the infection spread to it by way of the surface of the bone. The paper was discussed by Dr. Murray, of Ottawa.

"Chronic lesions of the breast" was the opening subject at the morning session of the second day. Dr. Etherington, of Kingston, discussed the management of early cases and insisted on the early recognition of cancerous conditions and of a complete and radical operation as constituting the only means of successfully combating cancer in this region. He strongly commended the use of radium in the primary dressing and as a post-operative measure. Dr. Roscoe Graham, of Toronto, demonstrated in a very interesting series of lantern slides the *gross and histological pathology* of the many forms of chronic breast lesions. Dr. Bazin, of Montreal, pleaded for care and refinement in our methods of diagnosis, and described how in several cases he had been able to avoid what is always of great importance to a woman, the mutilation of her breast. He outlined the technique for exploration of breast tumours, when such action seemed advisable.

The subject of anæsthesia is always of great importance to the surgeon, and was thoroughly dealt with by Dr. Wesley Bourne, of Montreal, and Dr. Shields, of Toronto.

The next subject for discussion was *"Hæmaturia"*, and was opened by Sir John Thomson-Walker, of London, who described briefly the various lesions of the urinary tract which might give rise to this symptom. He emphasized the necessity of determining beyond peradventure in every case the origin of the bleeding. Dr. David McKenzie, of Montreal, gave a most interesting lantern slide demonstration of the many lesions of the kidney and ureter which in his experience had been accompanied by hæmaturia; Dr. Austin, of Kingston, spoke of the various urological diagnostic methods and the best method of demonstrating these to the undergraduates.

The last subject for discussion was "Empyema", and was introduced by a paper by Dr. A. L. Lockwood, of Toronto, who presented a series of tables showing the "follow-up" results of cases of empyema; especially in those of a chronic character. Dr. Archibald, of Montreal, spoke of the difficulty of drawing conclusions from mortality statistics in conditions such as chronic empyema and comparing them with the acute cases which occur in a general hospital or in private practice. He considered that the classical rib resection was still the safest procedure in the hands of the average surgeon. Dr. Grant, of London, emphasized the importance of having the operation performed at the proper time.

THE MEDICAL SECTION

The work of the medical Section, and in this one may include the more strictly medical contributions which were delivered in the general meetings, contained nothing very new nor very radical. This, however, is not a criticism, but rather an observation. Further, unconsciously on the part of those who prepared the programme, there appeared in the majority of the papers and discussions a dominant note of conservatism as to the finality or the infallibility of a number of present day medical tenets, while at the same time due weight was given to their intrinsic usefulness. As a matter of fact a fairly comprehensive motto for the programme might read "All is not gold that glitters."

One might cite as examples Professor Macleod's survey of the value of the estimation of the basal metabolic rate as an aid to diagnosis in which he gave timely warning of the fallacies inherent in the method, and the wide range of "relativity" to the rest of the clinical picture by which its findings should be controlled.

In a similar way Professor Graham held up the flag in warning against the indiscriminate use of iodine as a specific in hyperthyroidism. The infallibility of present concepts of hypertension was questioned, and a plea for a more open mind toward this subject was urged by Dr. Goldie.

Dr. Joslin's address on diabetes and the resulting discussion brought before the meeting the fact that the older methods of treatment had been enhanced in value rather than superseded by the

use of insulin. Perhaps the keynote of the medical division was sounded by Dr. Parkinson of the National Heart Hospital of London in his address upon "The diagnosis of a healthy heart", which was a scholarly, concise and delightful exposition of a subject of universal interest to every medical man; and while the speaker touched on little that most of us have not learned, he pointed out much that we are apt to forget.

Who teaches the Englishman the English language? Whoever he is, he does it well.

It was altogether a sound and profitable meeting, but one might perhaps regret the absence from the section meetings of a greater number of stimulating contributions from the more eager and younger men. These do appear in numbers, but mostly in the proceedings of societies across the line, to the detriment of our National Association. Might we not at another meeting show our love for Cæsar not less, but for Rome still more?

A. H. G.

Correspondence

FAREWELL LETTER FROM ENGLISH DELEGATES

July 19th, 1924.
S. S. *Empress of Scotland*

Sir:

We should be glad if you would allow us to offer through the pages of the *Canadian Medical Association Journal* a word of thanks to all those who made our journey through Canada so memorable and so pleasant to us. Their name is legion, so it would be impossible for us to thank them individually, but we should indeed be ungracious if we did not try to convey to our many Canadian friends how grateful we feel for the unfailing kindliness which surrounded every step of our journey. We were told beforehand that Canadian hospitality was something to be remembered and now we know.

Our Association will be sending official messages of appreciation to those bodies and persons who paid special and official attentions to its representatives during their mission. This letter is intended as a purely personal message to those whose kindness we shall always remember.

We are,
Yours very sincerely,
T. Jenner Verrall,
Alfred Cox.

Marriage of First Cousins in Direct Line of Descent through four Generations.—The family described by Doublas P. Murphy, Rutherfordton, N. C., is of interest for several reasons: the large number of marriages between first cousins; the fact that four of these occurred in direct line of descent, and the striking lack of mental and physical deterioration as a result of such constant intermarriage. In the family tree presented, seven marriages took place between first cousins. Four of these were in direct line of descent. The second in direct line was a marriage of double first cousins. No physical abnormalities could be found in the entire family. Only one case of mental deviation, of mild type, was present, early in the family tree. The only pathological finding possibly the result of inbreeding, was the high infant mortality. This mortality was highest in the families in which the relationship of the ancestors was closest. From these investigations, it is assumed that: 1. The inbreeding in this family is a cause of a decided increase in infant mortality. 2. Mental and physical deterioration need not be expected to follow the intermarriage of first cousins.—*Jour. Am. Med. Ass.*, July 5, 1924.

XUM

Abstracts from Current Literature

MEDICINE

Pleurisy in Relation to Life Insurance. Rowley, R. L. *Minnesota Medicine*, May, 1924.

This is one of a series of papers by the medical directors of four of the leading insurance companies of North America. The writer brings out the point that to the insurance company a history of pleurisy implies a history of tuberculosis, and this latter disease is still a heavy burden on the insurance companies, in spite of a steadily diminishing death rate. Data to support this view of pleurisy are adduced both by medical men and by the insurance companies. The latter have collected statistics regarding the influence of pleurisy in insured lives, and have constructed tables to show that lives insured with a history of pleurisy (non-purulent) within five years of application, showed a mortality of about fifty per cent. more than the normal standard: also that of this group of cases with pleurisy, those whose illness was furthest removed from the date of insurance, had the greatest degree of mortality; and further, that the mortality was relatively greater in the younger lives and also in those under average weight.

These statistical studies are held to give enough basis for believing that the so-called idiopathic pleurisies are in most instances a manifestation of tuberculous infection. H. E. M.

An Analysis of the Clinical Histories of Patients with Pernicious Anæmia in the Johns Hopkins Hospital from 1918 to 1922 inclusive. Willson, Charles R., and Evans, Frank A. *Bull. of Johns Hopkins Hosp.*, Feb. 1924.

In this report, Willson and Evans give an analysis of the clinical histories and findings in 111 cases occurring at the Johns Hopkins Hospital between 1918 and 1922, in which by the strictest criteria, a diagnosis of pernicious anæmia could be made. At the outset, these writers urge the recognition of this disease as a clinical entity, determined by certain characteristic features to be indicated later. The disease seemed to be rare among the black race, as there were only eight of these in the series and all were mulattoes. Of the total number, eighty-two cases were men, twenty-nine were women, and over seventy per cent. occurred between the ages of thirty and sixty years. Howland is quoted as saying that in over 36,000 non-surgical admissions to the Harriet Lane Hospital, not one case of pernicious anæmia had been en countered, nor had he ever seen a case in a child.

Personal and family history appeared to have very little if any bearing, although many patients had suffered from malaria, pneumonia and typhoid, and the occurrence of the disease was irrespective of social status.

Weakness, gastro-intestinal symptoms such as dyspepsia, nausea and vomiting, diarrhœa, etc., and sensory disturbances of the extremities, were the main complaints for which these patients sought medical aid. There were practically none who had not one of these. Other symptoms occasionally noted were ataxia, dyspnœa, œdema, nervousness, pain in the back, hips and legs; loss of weight (three cases) vertigo (two cases) and mental deterioration. Analyzing the occurrence of the main symptoms while in hospital, it was found that weakness and fatigability occurred in seventy-eight per cent.; sore tongue in twenty-seven per cent.; gastro-intestinal symptoms in fifty-eight per cent., and disturbances pointing to the nervous system in almost seventy-seven per cent. The duration of the disease was difficult to fix.

On physical examination, the patients were generally well-nourished, loss of weight being a rare occurrence. In practically all the cases the skin was discoloured, being noted as yellow, ashen, icteroid, etc. As for the state of the mouth, the teeth were in bad condition in sixty per cent., twenty-five per cent. showed good teeth, and fourteen per cent. had had all their teeth extracted before coming under observation. Pyorrhœa was present in thirty-eight per cent., and in half of these, it was marked. Papillary atrophy of the tongue was marked in thirty-eight per cent., and in slightly more than this it was said to be absent. A clean tongue was always present, and the author's comment is that a coated tongue and a diagnosis of pernicious anæmia is a combination to arouse suspicion. The blood pressure was not particularly altered either way.

In four out of five cases the spleen could not be felt, nor was it enlarged to percussion. In one out of five, the spleen could be felt from 2 cm. to

a handsbreadth below the costal border. The liver was said to be enlarged in one out of three cases—from 1 to 5 cm. below the costal border. Retinal hæmorrhages were found in sixteen out of twenty-seven cases examined. Oedema of the extremities was noted in twenty-eight per cent. on admission, for the most part disappearing in a few days. Changes in the nervous system were found in seventy-four per cent. of cases, either in sensation or in reflexes. Nine patients showed Babinski's sign, and a few showed loss of vibration sense over the feet.

The anæmia once established tends to persist. On admission to the hospital, sixty per cent. of the series showed a red cell count below two million, and eighty-seven per cent. were under three million. The hæmoglobin was over seventy per cent. in ten per cent. of the cases. The colour index in nearly all cases was above 1, and ran as high as 1.6 and 1.7 in some. Anisocytosis and poikilocytosis were generally well marked. Nucleated reds were found in at least one film in fifty-eight per cent. These, if normoblastic, were considered of good prognostic omen—as far as the immediate future was concerned, but if megaloblastic, the outlook was regarded as poor. A leucopenia was practically a constant—there being only eleven cases which at some time or other did not show a white blood count below 5,000. A leucocytosis, even if mild, in the absence of an infection argues against its being pernicious anæmia. The leucopenia is of the polymorphonuclear neutrophiles, and this is characteristic but may not show in single counts. The platelet counts were not done.

Gastric analysis showed an absence of free HCl in every case, while the total acidity in eighty-five per cent. was not above ten. Two-thirds of the series had no fever, except possibly in connection with a post-transfusion reaction. The remaining one-third showed fever to 100°, or occasionally to 101°—but the febrile manifestation did not appear in any way to influence the course. A. T. HENDERSON

Calcium Treatment for Oedema. Rockwood, Reid and Barrier, Charles W. *Archives of Internal Medicine*, May 15th., 1924.

The authors report the effect of large doses of calcium given orally in cases of massive œdema of diabetic and nephritic origin. Their studies were carried out on three cases of diabetes with œdema, and four cases of œdema of nephritic origin. They first quote the work of Myer and Cohn, in 1911, who found that by giving calcium salts they could cause a decrease in weight due to water loss. In the case of calcium chloride, the calcium ion seemed to be largely excreted in the stool, while the chlorine ion was excreted in the urine in combination with other bases.

In 1918, Schultz, on the basis of the work of Myer and Cohn, treated ninety-three cases of war nephritis with large doses of calcium chloride, and in many instances the œdema entirely disappeared. In certain cases there appeared to be a cardiac factor and the disappearance of œdema was benefitted by a combination of digitalis and calcium.

In 1918, Hulse reported eight cases of war nephritis with œdema treated successfully by doses of calcium chloride of from fifteen to twenty grammes a day. He believed that the calcium in some manner freed the sodium chloride and water that were held by the tissue colloids.

In 1921, Blumer and his colleagues reported similar results but stated that no benefit was obtained in cases of œdema of cardiac origin; in fact several patients became worse. Some benefit was derived in cases of ascites due to cirrhosis of the liver, and in pleurisy with effusion. These observers also found that good results were not obtained unless the patient was on a diet low in salt. Some of the results following administration of these large doses of calcium might possibly be interpreted as being due to the dehydrating action of large doses of a salt.

Two workers, Bowler and Walters, had found that the administration of large doses of calcium intravenously resulted in toxic symptoms, but no such ill effects were noted by Rockwood and Barrier when the calcium was given by mouth. The amount given varied from twelve to eighteen grammes daily. In the first case treated, one of diabetic œdema, there was an unexplained consistent and marked rise in the basal metabolic rate (from minus 13 to plus 57), toward the end of the period of calcium administration and as the œdema was decreasing. A similar dose of calcium had no effect on the basal metabolic rate of a normal person, nor in the other cases stated. In six of the seven cases, most of which had been resistant to other methods of treatment, œdema disappeared completely. In one case œdema disappeared, but the part played by calcium was questionable as there was no diuresis. In two cases of nephritis œdema recurred later. None of the cases were complicated by significant myocardial damage. Small doses of calcium (from one to three grammes daily) had little or no ef-

fect. In some cases calcium lactate was sufficient. In other cases calcium chloride seemed more effective. The large doses of calcium did not seem to increase the amount of serum calcium.

The authors also found that calcium chloride was much more difficult to take than calcium lactate. Gastric distress, nausea, vomiting and diarrhœa were not uncommon. They avoided these symptoms to some extent by giving the substance in capsule form. They believe that in all cases calcium lactate should be tried first, and if that is not effective an attempt should be made to try calcium chloride. Because of the higher molecular weight, the percentage of calcium by weight in calcium lactate is thirteen per cent., while it is about twenty-seven per cent. in the case of calcium chloride. In one case of chronic glomerular nephritis renal function was definitely improved as the œdema subsided. Recent analysis of milk show from 0.99 gm. to 1.6 gms. of calcium for each litre. This corresponds to from 7 to 12 gms. of calcium lactate for each litre. This finding, the authors think, may explain the diuretic action of milk and thus its popularity in the treatment of acute nephritis.

L. C. MONTGOMERY

Factors, Actual and Possible, in Cardiac Nutrition. Pratt, F. H. *Boston Medical and Surgical Jour.*, February, 1924.

This is a consideration of some of the structural and mechanical factors in the nutrition of the heart. The inquiry is suggested by the problem of how the heart is able to continue its function with the coronary arteries partially blocked, or even with total occlusion of important branches. Subsidiary channels must play an important part under such circumstances. He considers four channels by which nutriment passes through the heart: the coronary stream, the pulmo-systemic, the sinusoidal, and the lymphatic.

(1) The coronary stream is the mainstay of the heart's activity. The older anatomical teaching was that these vessels did not anastomose, but recent work, especially that of Gross, has shown that there is a very free anastomosis, and this becomes more marked in successive decades of age. But such collateral circulation is not enough to prevent the generally hopeless results which follow any sudden blocking, as in embolism.

(2) It is conceivable that the heart receives a certain amount of nourishment from the blood passing through the various chambers, by virtue of absorption by the endothelium.

(3) In suggesting a sinusoidal stream, the writer points out that the embryonic mammalian heart resembles the amphibian heart, in being not so much a cavity with definite walls as a spongework in which ramify irregular branching channels, lined with intima. As development goes on these channels become involved in the muscular tissue, which eventually becomes the columnæ carneæ, trabeculæ and papillary muscles. Some of these embryonic sinusoids persist as the Thebesian vessels. Such channels, it is suggested, may be of considerable importance in a heart whose ports are acutely or progressively closed.

(4) The lymphatic stream of the heart requires to be elucidated further. But it is known that there is a rich lymphatic plexus in the myocardium, and as an additional channel of nutrition it is worthy of consideration. H. E. M.

SURGERY

A Communication between the Vagus and the Cervical Sympathetic, with its Clinical Aspects. Shawe, R. C. *The Lancet*, March 29th., 1924.

An anatomical fact which has been recently brought into prominence by Jonnesco's operation for the treatment of angina pectoris, is the communications between the vagus and the sympathetic in the neck: in this operation he extirpates the middle and inferior cervical sympathetic ganglia. Dr. Shawe describes in detail some of the connections between these sympathetic ganglia and the vagus nerve, and its recurrent laryngeal branch. The text-book description of these connections is scanty and variable, and he performed fresh dissections to clear up the point. He found such communications in sixty-eight per cent. of his specimens, and thinks that the percentage would have been higher but for the fact that some of the bodies were first dissected by students. In some cases the connection was between both of the lower cervical ganglia and the vagus: in other cases the link was between the ganglia and the recurrent laryngeal branch, rather than the vagus itself.

The essential point is that these connecting fibres pass down through the vagus into the aortic and cardiac plexuses, and the inference is made that they serve as channels for sensory impulses concerned in the reflex control of the heart. If we suppose that these connections serve to trans-

mit abnormal impulses to the upper dorsal segments of the cord, whence anginal radiations may occur, then Jonnesco's operation is seen to be based on a thoroughly sound rationale, anatomically. These nerves form a concentration point for the sympathetic cardiac fibres from the upper dorsal segments, and as such "present a readily accessible isthmus at which to attack the vicious cycle of irritation by surgical methods."

H. E. M.

Carbuncle and its Treatment by Magnesium Sulphate. (The late) Morison, A. E. *Brit. Med. Jour.*, April 19th., 1924.

This is a method for treating carbuncles without operation; attention is drawn to the fact that our present methods are too numerous for any one of them to be considered infallible. This treatment consists in the use of a paste composed of magnesium sulphate and glycerin—one and a half pounds of the salt to eleven ounces of glycerin. The glycerin is put into a hot mortar and the salt slowly added and well mixed in. A piece of lint is spread thickly with the paste and applied to the carbuncle, the dressing being completed with jaconet and cotton wool. A profuse discharge of serum occurs in a few hours, and the dressing should be changed about twice a day. There is early relief of the pain, and in a few days the slough separates. The cavity is then dressed with moist dressings of a saturated solution of magnesium sulphate and glycerin.

Twenty-eight cases of carbuncle have been treated in this manner, with good results.

H. E. M.

Extra-peritoneal Cæsarean Section (Gastroelytrotomy) in Presumably Infected and Mismanaged Cases of Prolonged Labour. Davis, Asa B. *Amer. Journ. of Obst. and Gyn.*, April, 1924.

Broadly speaking, childbirth is pathological in ten per cent. of cases, and since death from this is next in frequency to tuberculosis every case should be most carefully observed, and the emergency type of maternity case reduced to a minimum. The classical Cæsarean section is contra-indicated where there is disproportion between the presenting part and the pelvis in cases where the membranes have ruptured, or repeated digital examination made, or where some operative delivery by vaginal route has been attempted.

In an attempt to reduce the death rate in these presumably infected cases and avert destruction of the child, the author has developed a technique of abdominal delivery by the extra-peritoneal route. Incision is made slightly above and parallel to Poupart's ligament, care being taken not to enter the peritoneal cavity. The hand is then inserted retro-peritoneally, at the utero-vesical fold, and the peritoneum raised. The uterus is incised and the child delivered by internal podalic version. At no time is the peritoneal cavity opened. The operation is attended by the risks of, perforating the peritoneum, excessive hæmorrhage, prolonged operating, and damage to the bladder, but the death rate from infection is materially reduced.

The deaths in nearly 600 classical Cæsarean sections performed by the author, reached eight per cent.; whereas, in twenty-eight proven infected and presumably infected cases delivered by the extra-peritoneal method, there were only two maternal deaths. There were seven fœtal deaths in this series, but life in these was jeopardized by protracted labour, cerebral compression, or maternal infection.

A. D. CAMPBELL

Bipartite Patella. Fournier, J. *Revue d'orthopédie*, September, 1923.

This article has to do with an anomaly of the patella characterized by its appearance in two segments, one being the main portion and the other, much smaller, situated at the periphery, usually at the supero-external angle. This anomaly is bilateral and as a rule symmetrical. It is revealed only by the roentgenogram and is to be regarded as a congenital anomaly due to a point of complementary ossification. Thus the original conception of the invariable development of the patella by a single centre needs modification. Its clinical importance is in two distinct classes. 1. In childhood this epiphyseal centre may, like that of the os calcis or of the tuberosity of the tibia, become irritated and inflamed, causing an effusion in the knee joint. Without a knowledge of the presence of such an abnormal epiphyseal centre at the margin of the patella, the origin of the joint effusion would be in doubt. In such a joint condition, rest usually suffices for a cure. 2. In adult life, following an injury to the knee, the radiogram might be wrongly interpreted as showing a vertical fracture of the patella. A radiographic examination of the uninjured knee would, however, reveal exactly the same condition, thus ruling out fracture.

J. APPLETON NUTTER

The Tabetic Spine. Roger, Henri. *Paris Médical*, November 24th., 1923.

The writer notes the appearance of bone and joint changes (spontaneous fractures, Charcot joints) in tabetics, and considers that not sufficient importance has been given to the vertebral changes, six cases of which he reports. A typical case will show a gradual onset of lumbar deformity, kyphosis with scoliosis, generally without pain, but not necessarily so. The vertebral deformity is usually discovered late and often by accident. At times it is accompanied by crepitus in the affected area. The tabes itself has as a rule become well developed. The spine is freely movable at the affected area, and as a rule little or no pain is elicited by palpation or percussion. The presence of free movement at the site of lumbar deformity is looked upon as a pathogenic sign. The roentgenograms show an interesting association (as in other tabetic arthropathies) of destruction and proliferation, the bodies of the third and fourth lumbar vertebræ being most often attacked. These show irregular destruction leading to lateral and antero-posterior deformities, with marked bony proliferation appearing laterally above and below, where the vertebral bodies are in apposition. The affected area may as a result show great enlargement in the roentgenograms, and, accompanied by evidences of tabes, such findings may be considered pathognomonic. Accessory symptoms are pain in abdomen and legs, with hypæsthesia, etc. The writer attributes much of the pain to osteophytic compression of the nerve roots, but never to medullary irritation or compression. As the disease progresses the patient becomes more and more humpbacked, while the gait reveals the incoordination of the tabetic.

Treatment—Anti-syphilitic medication is indicated, as well as a plaster jacket or other immobilizing apparatus in early cases. When the deformity has become fixed, this latter will be of little service. In the case of vertebral deformity of sudden onset following mild traumatism, it is well to suspect spontaneous fracture of a tabetic spine and to search for the usual evidences of tabes (loss of knee jerks, lightning pains, and Argyll-Robertson pupil). J. Appleton Nutter

Solution of a Serious Kineplastic Problem. Bosch Arana and Wildermuth. *Revue d'orthopédie*, July, 1923.

This paper has to do with the problem of designing an efficient artificial arm, the finger flexion of which is to be under the control of the flexor muscles of the stump in cases of amputation only a few inches below the elbow. The flexor-pronator muscle mass on the anterior aspect of the stump is tunnelled to permit the use of a thong. The contraction of the muscle mass, in extent about 4 cm. only, pulls up on the thong, which in turn causes finger flexion. The difficulty has been that flexion of the elbow at once shortened the distance between the muscle mass and the artificial hand, with the result that with elbow flexion the finger movements due to the pull of the muscle mass disappeared. The grave problem referred to is the question of how to design an artificial arm for such a kineplastic operation, permitting artificial movements of the fingers in elbow flexion as well as in extension. Various unsuccessful expedients are described. Success has been achieved by the use of an ingenious device by which the distance between the artificial hand and the elbow joint is gradually increased as the elbow is flexed, thus maintaining exactly the distance between the hand and the muscle mass and permitting no slackening of the thong. In this way artificial finger flexion is permitted quite as strongly and with as great an amplitude of motion whether the elbow is extended or flexed. The illustrations should be studied. J. Appleton Nutter

PAEDIATRICS

Subacute Intussusception. Bergstrom, Victoria C. A., M.D., New York. *Ameri. Journ. of Diseases of Children.* May, 1924.

Four case histories are reported, of infants and children presenting the cardinal symptoms of intussusception, but in whom, because the symptoms were not severe, a wrong diagnosis had been made, usually dysentery, and accordingly no operation for relief of the intussusception had been performed. When a healthy nursing infant in the middle third of his first year suddenly develops pain of a paroxysmal character, accompanied by vomiting whenever food is taken, one naturally thinks first of intussusception. If bright red blood is passed by rectum it only remains to palpate the tumour to make certain of the diagnosis. The symptoms of the subacute type resemble the acute in most of the particulars, except that they are more moderate in their manifestations, and for that reason the diagnosis may be unduly delayed.

Three of the cases reported were nursing infants who had never been ill. At the onset of the pres-

ent illness they all showed bloody stools, varying from a few tablespoonfuls in two cases to enough to constitute a profuse hæmorrhage with the third. Vomiting and pain and subsequently watery stools were present. An abdominal tumour was palpated in two. Operation, performed eight days after the onset of symptoms in two cases, resulted in recovery. The third was moribund and died before operation, sixteen days after the onset. Necropsy showed peritonitis and intussusception. The fourth case was a boy of eight years who had pain, vomiting and a palpable tumour, but had passed no blood by rectum. Operation, eight days after onset, resulted in recovery. R. R. S.

DERMATOLOGY

The Causes of Fur Dermatosis. White, R. Prosser. *Jour. of State Medicine*, January, 1924.

This is an exhaustive article dealing with skin disease due to fur, both in the workers and those who wear it. The demand for fur is very large, and manufacturers are on their mettle to devise ways of utilizing the skins of the more common animals.

The first place in the etiology is given to "imitation coney seal", which is a common variety of fur edging for garments, and may prove very irritating to the skin. The operatives who model these furs are affected on the hands and arms; the wearers suffer from a dermatitis about the neck and wrists. The supply of natural fur is much less than the demand, so that substitution is rampant. House cat is dyed to represent skunk, fitch to represent sable, hare to represent fox or sable, and rabbit to represent coney seal; and there are many other substitutes. When natural skins are cured, tipped or softened, injury may be caused to the workers, but not the users. It is when cheapness demands mordants and dyes that an irritating residue is liable to be left in the faked material, and the wearer suffer as well as the operative.

Arsenic and alum constitute the first treatment of the skins, and then a pickle containing sulphuric acid. Subsequently they are immersed in an alkali, which acts as an irritant unless carefully neutralized and washed off. "Mordanting" or fixing with metallic salts is the next process, and is always necessary for deep colours. There is danger of an incomplete change of these metals into their oxides. Dyeing follows the fixing process, and is a comparatively new art in the fur industry. Aniline dyes are used entirely, except for the cheapest blacks, for which basic and acid dyes are employed. Metol and amidol, known to photographers—represent the type of dye used, and these require subsequent oxidation by quinone, hydrogen peroxide and some other oxidizer. Quinone is a dye which colours the skin and hair brown, not black. The application of quinone is an after-treatment to alter the colour produced by the aniline dye, and gives a yellowish shade to the material. Errors of temperature or other faults in technique will cause the liberation of large quantities of quinone in the dye bath and on materials. The vapour and dust particles of quinone are very irritating to the exposed parts of the workers and wearers.

The author applied cheap dyed hare fur to one forearm, and to the other he applied high class dyed fur. Both were damped twice daily and it was found that the hare caused a marked dermatitis on the second day, whilst the reaction from the other was nil. The mordant or dyes must be held responsible. Their acid salts are dissolved out by the perspiration, and irritation results. This explains the fact that it is on the damp or warm days at the beginning or end of the winter that most of the fur dermatoses occur. No mention is made of the mechanical effect of hair on the human skin, though it must enter into the etiology of skin disease from fur.

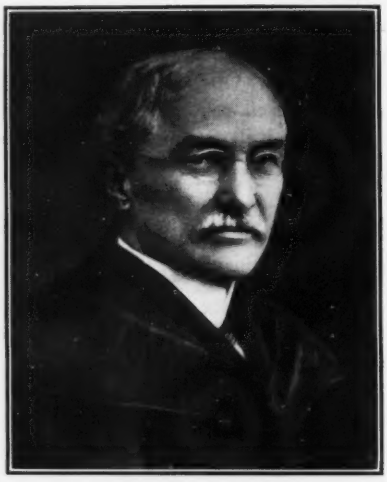
In the high class careful dyeing the residue is removed by ample washing. The prevention of these troubles in the fur industry is a difficult problem to tackle, and can only be accomplished when furriers exercise extreme care in the finishing and dyeing processes, with particular attention to cleansing. C. R. B.

No Time to be Brief.—It is customary to attribute the only excuse for prolixity to the Scottish minister who apologized for the length of his sermon by alleging that he had been too busily engaged to make it short. Mr. Alban Doran informs us that the original source is in Pascal's *Lettres Provinciales* (end of sixteenth letter "aux Pères jésuites"): "Je n'ay fait celle-cy plus longue que par ce que je n'ay pas eu le loysir de la faire plus courte."

Obituary

DR. F. R. ECCLES

Dr. F. R. Eccles died at his residence 288 Princess Ave. London, Ont. on June 12, 1924. He was born in the township of Warwick, county of Lambton, Ontario, on January 25, 1843, and received his early education at the local public school and in the Sarnia Grammar School. He taught school for a few years and then entered upon the study of medicine in the medical department of the University of Toronto, from which he obtained the degree of M.B. in the year 1867, and M.D. in 1868. He also received the degree of M.B. from the Bellevue Medical College in 1867. Dr. Eccles began the practice of medicine in Arkona, Ont. where he remained nine years. In 1876 he went to England for post-graduate study, obtaining in 1877 the degrees of M.R.C.S. England and F.R.C.S. Edinburgh. Some time later he was made a Fellow of the Obstetrical Society of London, England. He was appointed lecturer in physiology in the Western Medical School at its inception in the year 1882, resigning after a number of years to become professor of gynaecology, which subject he had studied with the late Dr. Lawson Tait, and for many years he was regarded as one of the foremost gynaecologists in western Ontario. He is said to have been the first to engage in abdominal surgery, the first to use the Lister spray and thus the first to introduce modern antiseptic surgery in London, Ontario. He also performed the first successful ovariotomy in London.



DR. F. R. ECCLES

In 1881 he was appointed examiner in surgical anatomy for the College of Physicians and Surgeons of Ontario, and in 1915 he succeeded the late Dr. James McArthur as representative of territorial district No. 3. Dr. Eccles was an attractive lecturer and teacher, his classes were always well attended. He endeavoured to keep himself informed of all important advances made in professional knowledge, and took frequent trips to Europe for post-graduate study. He succeeded the late Dr. Moorhouse as Dean of the Western Medical School, a position which he held until the reorganization of the faculty in 1913. The degree of LL.D. was conferred on him by the University of Western Ontario in 1916. Dr. Eccles was twice married, his first wife being Mrs. Hawksworth, daughter of the late Amasa Wood of St. Thomas. His second wife, whom he married in 1902, and who survives him, was Miss Dusty of St. Mary's. He was a man of considerable wealth, and bequeathed the sum of $110,000.00 to the Medical Department of the University of Western Ontario; also a liberal sum to the Home Mission and Superannuation Fund of the Methodist Church. Some years ago he gave his theological library, consisting of several hundred volumes, to the First Methodist Church in London, of which he had been an official member for a number of years.

U. E. BATESON

Dr. G. Robertson, a graduate of McGill University, died in Liverpool, England, June 11th, at the age of 45 years, from the effects of an injury to the heart received a few years ago in England. Prior to the war he acted as surgeon on the White Star Line of steamships; when the European War broke out he joined the navy and served in West Africa until the Armistice was signed. He was an M.R.C.S. and L.R.C.P. of London, Eng.

The medical profession of Nova Scotia has recently been called upon to mourn the loss of three of its members. On the 12th of June, Dr. Marcus Dodd, scion of a distinguished Cape Breton family, died at his home at Bridgeport after 58 years of practice. One of the old school, noted for his kindliness and courtesy, Dr. Dodd was greatly beloved. On the 7th of July, Dr. John A. Ferguson, physician to Dominion No. 6 Colliery, died, after several months' illness, at the Glace Bay General Hospital. Dr. Ferguson was a graduate in Science and Medicine of Dalhousie University, and while a comparatively young man, has through his sterling qualities, skill and public spiritedness, greatly endeared himself to his clientele. On the 8th of July Dr. Vernon C. Morse died at his home at Paradise, at the age of 46. After graduating at Harvard, Dr. Morse practiced for several years in Massachusetts and returned to Nova Scotia only a few years ago. He did not enjoy good health, and was able to mingle little with his fellow practitioners, but his kindly disposition and cheerfulness, despite his knowledge of the fatal character of his illness, won for him the esteem and admiration of a large circle of friends.

Capt. J. R. L. Gravel, M.D., late of the Canadian Army Medical Corps. in France, was drowned in the river at Longueuil, July 5. Capt. Gravel was spending the evening with some of his fellow officers when at a late hour he decided to go for a row by himself. His disappearance was not noted until the next morning when his fellow officers instituted a search. This continued all morning and afternoon ; the body was discovered on the shore late in the afternoon, the boat upside down, was slowly drifting along the shore. Dr. Gravel was 35 years of age. He was born in Joliette, Que., and practiced in that town for several years. Shortly after the war started he enlisted and went overseas with the C.A.M.C. doing duty in hospitals in England and France. He is survived by his wife and six children.

G. H.

Medical News from the British Empire

GREAT BRITAIN

SIR CHARLES SCOTT SHERRINGTON, O.M.

In the recent list of the recipients of Birthday Honours is the name of Sir Charles S. Sherrington, G.B.E., on whom is conferred one of the most coveted distinctions, membership in the Order of Merit.

The Order, founded in 1902 by the late King Edward to distinguish specially those who have achieved great distinction in the arts, literature, philosophy and science, and in military service, can consist of not more than twenty-four members, and until recently it included nine civil and five military. It does not give precedence although it is authorized the follow the first class of the Order of Bath and to precede the letters designating the other classes of that Order and all classes of the remaining Orders of Knighthood.

Among those who received this distinction were Lord Kelvin, Lord Lister, Lord Rayleigh and Lord Morley, and amongst the present members of the Order are Professor Sir J. J. Thomson, Sir Archibald Geikie, Thomas Hardy and the Earl of Balfour.

Sir Charles Sherrington is the second representative of medical science to receive the distinction and it is well merited. As Professor of Physiology in Liverpool University and afterwards as Waynflete Professor of Physiology in Oxford he has given thirty-five years at least of his life to assiduous research on the nervous system, and to-day he is recognized the world over as the leading authority in the subject. He has received honorary membership in a host of learned societies, European and American; he is an honorary graduate of eleven British, Canadian and American Universities; he has been since 1920 President of the Royal Society, and he was in 1922 President of the British Association for the Advancement of Science. In 1921 he was created Grand Commander of the Order of the British Empire.

Sir Charles is well-known personally to many in Canada interested in medical education. In 1904 he delivered a special address at the inauguration of the new medical laboratories of the University of Toronto, and he gave the leading address at the formal inauguration of the new biological building of McGill University in 1922.

This *Journal* joins his many Canadian and American friends in extending to him the most cordial congratulations on the recognition of the value of his labours in research which the distinction involves.

The case of Bond v. Harnett presents further developments. It will be recalled that this was an action for damages against two physicians for wrongful detention as a lunatic by a Mr. Harnett. After a trial lasting 17 days, damages to the extent of $125,000.00 were allowed. Dr. Bond, one of the defendants, was a commissioner in lunacy, whilst the other physician, Dr. Adam, was the proprietor of the asylum in which Mr. Harnett had been in detention since 1912. In that year, after some months' detention for what appears to have been some form of acute mental disturbance, he was allowed out temporarily. He went to the commissioner's office to ascertain why he had been placed in the asylum, and during the interview became very excitable and was sent back to the asylum by Dr. Bond. After this he was kept under close watch, and as time went on was transferred from one asylum to another: in one he acted as librarian for four and a half years, cataloguing more than 1,000. volumes. Eventually he escaped and remained hidden for more than fourteen days, and by virtue of his eluding the authorities for this period regained his freedom. Examination by expert opinion then declared him sane.

The damages were divided in the proportion of $87,500 against the commissioner, and $37,500 against Dr. Adam. The case was appealed and in the higher courts the verdict and judgment were set aside and in the case of Dr. Adam the costs of the action and appeal were entered for him, but a new trial was ordered for Dr. Bond, and certain limitations were set on the amount of damages which might be awarded.

Much perturbation had been caused in medical circles by the judgment of Mr. Justice Lush, before whom the case had first been tried to the effect that once a man is certified insane and so detained as a direct consequence of this certification, the acts of subsequent medical men in recertifying, or of visitors appointed under the Act in reporting adversely as to his sanity, were mere acts of omission, or formalities; the medical man who originally certified him continuing to be directly responsible for the detention. The validity of this opinion was explicitly denied in the higher court.

The case has raised the whole question of administration of the lunacy law, and in reply to a question in parliament, the Prime Minister said that the government was prepared to consider the setting up of an appropriate body for inquiring into the matter. Such a commission, it was later announced, will be appointed in the near future.

The medical supervision of the British Empire Exhibition gives evidence of the careful planning which characterizes the entire project. Sanitary officers make daily inspections of the grounds, palaces, all interiors, the sanitary conveniences, and the native quarters; the latter are of large extent and add to the intricacy of conditions. There is a main ambulance station with fourteen beds, two fully equipped smaller stations together with subsidiary equipment in all the main buildings. Both the British Red Cross Society and the Order of St. John have helped largely in providing equipment, including three motor ambulances. Arrangements have also been made with hospitals in the neighbourhood to take care of any unusual number of casualties . H. E. M.

SOUTH AFRICA

Some interesting details in the medical history of the Cape Colony were brought out in a recent address by Sir George Cory. The Cape first came under British rule in 1806, when the medical men of the country were chiefly surgeons of the Dutch East India Company. But there were also a great many quite untrained individuals who styled themselves surgeons, physicians or apothecaries, and who apparently did not

hesitate to prescribe the most potent of poisonous drugs. Steps were taken to improve conditions by the appointment of a supreme medical committee, who had the power to examine the qualifications of anyone practising medicine and to fine them if they proved unqualified. Under the next Governor-General not only was the fine to be imposed increased, but an attractive tariff of fees was legalized for medical men.

This medical committee was replaced in later years by a Colonial Medical Inspector, and the second individual to hold this position was that extraordinary medical character Dr. James Barry who is referred to as one of the most remarkable cases of concealed sex known to the medical world. While circumstances may have partly accentuated her characteristics she certainly gave evidence of a very irritable temper. She quarrelled with the Governor and his officials, and in one instance was cited for contempt of court,—and she threatened to cut off the "Jew's ears" of the Attorney-General on his having repeatedly summoned her as witness in an inquiry into the conditions of the Cape Town prison, on which she had reported adversely. She was told that the improper language in which she couched her official correspondence... "greatly embarrassed the Government," and was dismissed. Her sex was not discovered until her death in England at the age of 80, but it appears that there was some suspicion of the fact in Cape Town.

Another picturesque figure was Dr. John Atherstone, "District Surgeon, general philanthropist, and keeper of a menagerie." But his philanthropic tendencies evidently did not always exhibit themselves for one patient (at least) was badly bitten by a monkey who seems to have kept some sort of a post at the surgeon's door. Dr. Atherstone was probably the first man to civilize and educate a cock ostrich; on this bird he used to allow the local blacksmith to ride, until one day relations became strained between the doctor and his jockey. The latter showed his resentment by throwing a small piece of red-hot iron at the bird, who swallowed it and forthwith died "of some kind of indigestion." Dr. Atherstone had a distinguished son, who was the first to administer chloroform in South Africa. He has a further claim to renown, however, in his knowledge of geology, for it was he who identified the first diamond found in Kimberly.

H. E. M.

News Items

GENERAL

We learn that a gift of one hundred and ten thousand dollars ($110,000) has been bequeathed to the Medical School of the University of Western Ontario, London, Ont., by Dr. F. R. Eccles. This sum is to be an endowment, and a portion of it may possibly be used to endow a professorship. Further, Dr. Eccles, in his will, stipulated that after the lifetime of two relatives an additional sum of two hundred thousand dollars becomes available for the whole university.

NOVA SCOTIA

Dr. Daniel MacDonald, of North Sydney, was elected president of the Association of Medical Health Officers, for the current year, while Dr. A. C. Jost, of Halifax, has been re-elected Secretary.

At the Clinical Congress of the Maritime Provinces Section of the American Congress of Surgeons, recently held at Charlottetown, P.E.I., Dr. Geo. H. Murphy and P. D. McLarren of Halifax, were elected President and Secretary, respectively, for the now current year. The next meeting is to be held in Halifax.

Provision has been made by the Canadian Department of Marine and Fisheries for medical aid and hospital treatment for fishermen engaged on the Grand Banks and generally for sailors on the Canadian and Newfoundland vessels which may be in neighbouring waters. The government steamer *Arras* has been fitted up as a hospital ship, with Dr. Stanley H. Peppard in charge of the medical service, and is now on duty on the Grand Banks. The base of supplies is to be St. John's, Newfoundland.

Dr. O. S. Gibbs has arrived at Halifax to take the chair of pharmacology at Dalhousie University. Dr. Gibbs has been associated for some years with Professor Cushny, at the University of Edinburgh, and comes to Dalhousie with a record of excellent research work and with high recommendations.

The many friends of Professor Fraser Harris will be greatly pleased to learn that he is now quite restored to health, but will regret that he has decided to abandon the field of teaching, in which he was so conspicuously successful. This decision is particularly regretted by the Dalhousie Faculty of Medicine, by whom he has always been held in the highest esteem and affection. Few men have the gift of presenting their subject so clearly, emphatically and artistically, and the resignation of Fraser Harris from the Dalhousie Faculty removes a charming personality, a prodigious and versatile worker, an exceptional teacher and a wise counsellor.

All arrangements have been completed for the post-graduate course to be given under the auspices of the Dalhousie Faculty of Medicine during the first half of September. A very attractive programme, the charm which Halifax offers at that season, and the participation in the programme of several medical teachers of international renown should assure a large attendance. A copy of the programme may be obtained on application to the Hon. Secretary, Dr. W. Alan Curry.

The Nova Scotia Division of the Canadian Red Cross Society continues to manifest a keen and practical interest in public health matters. This year it is maintaining travelling clinics in several counties, particularly in the interest of the children of districts remote from medical and dental advantages. A fine spirit of co-operation is being shown between the

Provincial Department of Health and the Red Cross, and officials of the Department are intimately associated with the work of the clinics.

The Medical Society of Nova Scotia met at Amherst on the 15th, 16th and 17th of July under the presidency of Dr. O. B. Keddy of Windsor. Several sessions were held conjointly with the Association of Medical Health Officers and the Association of Graduate Nurses. Visiting physicians who gave addresses included Professor S. Lyle Cummins, of Cardiff, Wales; Dr. George David Stewart, of New York; Drs. H. M. Little and A. Pirie, of Montreal; Dr. C. D. Parfitt, of Gravenhurst; Dr. T. C. Routley, of Toronto, and Dr. R. E. Wodehouse, of Ottawa. A large amount of important business was transacted, but a reasonable amount of time was set aside for the enjoyment of a profusion of opportunities for recreation arranged by the physicians of Amherst. The next meeting will be held at Bridgewater and Dr. W. N. Rehfuss, of that town was chosen as the new President, Dr. J. G. D. Campbell, Halifax, as Secretary, and Dr. S. L. Walker, of Halifax, Associate Secretary.

QUEBEC

Dr. J. B. Lacroix, who has come to take charge of experimental medicine in Laval University, Quebec, has organized a laboratory of experimental physiology and medical chemistry.

Dr. A. H. Desloges, Director of Public Health in the Province will represent Canada at the League of Nations health committee. Dr. Odilon Leclerc, director of dispensaries in Quebec, will attend the third annual congress of the International Association against Tuberculosis, about to be held in Lausanne and will study the most modern methods of fighting the white plague. On his return, Dr. Leclerc will make a tour of the anti-tuberculosis dispensaries in Quebec, and advise on any further improvement that may be possible in their management. The opening of a new series of dispensaries will then be announced.

New Faculty Club.—The organization of a Faculty Club for the members of the various faculties of McGill University was discussed at a meeting attended by 200 members of the teaching staff and recommendations were made to a general committee regarding the management. The teaching body in McGill, especially the younger members of the staff, have suffered in the past from the disadvantage of having no common meeting place.

The new club will prove a boon to all and will remove the pressure on the University Club without interfering in any way with its activity. Premises in the vicinity of the University were bought last year which will provide ample accommodation, including a dining room, lounge and reading rooms and a few bedrooms. The membership is expected to be between 150 and 200. The Board of Governors will provide and equip the building, while the club may pay a small rental.

A Short Post-Graduate Course for Medical Men.—Beginning September 1, a two-weeks' post-graduate course for qualified physicians will be given at Halifax under the auspices of the Faculty of Medicine of Dalhousie University. This course is free to all physicians, no matter where they may reside, and is for the present undertaken as a part of the public service which Dalhousie endeavours to render. The course was instituted in 1922 and repeated last year, but on both occasions lasted only for a week. The interest it has created, however, and the number of physicians who have attended, have encouraged the faculty to double the length of the course, and also to invite prominent doctors from other colleges to take part in the teaching. This year Sir Henry Gray and Doctors Chipman and Rhea, of Montreal; Dr. Rudolph of Toronto, Doctors Luther MacKenzie and Ross Faulkner of New York, and Dr. A. F. Miller of Kentville, as well as members of the faculty, will give lectures or clinics.

The new Pathological Building, McGill University, will be officially opened on Founder's Day, October 6th, at 3.30 p.m. in the presence of representatives of other important institutions and a few of the leading pathologists of Great Britain, Canada and the United States. Members of the Faculty and its guests will proceed in full academic dress from the Redpath Library to the new building, where addresses will be given. The usual Founder's Day ceremonies will take place in the evening at the Royal Victoria College. The address will be given by Sir Arthur Currie, principal of the university, after which the Convocation for the conferring of degrees will take place.

French Doctors meet in Quebec.—Medical men speaking the French language will meet in the ancient capital on September 10th to 12th under the auspices of the Association des Médecins Français de l'Amerique du Nord. In addition to members of the profession in Canada and the United States, a representative delegation from Europe will be present. Hon. Athanase David, provincial secretary, has accepted the office of honorary president of the congress. Its sessions will be held in the University Building. For the general addresses, the Parliament Buildings, and the City Hall will afford spacious accommodation.

MANITOBA

The undermentioned are the officers of the Manitoba Medical Association elected at the annual meeting, June 24th, 1924. Members of the executive committee to the number of nine are still to be appointed by the College of Physicians and Surgeons and the six district societies.

President, Dr. W. A. Gardner, Winnipeg; Vice-President, Dr. J. C. McMillan, Winnipeg; 2nd Vice-President, Dr. A. F. Menzies, Winnipeg; Hon. Secretary, Dr. N. W. Warner, Winnipeg; Hon. Treasurer, Dr. W. L. Mann, Winnipeg.

Executive.—Dr. E. J. Boardman, Dr. D. A. Stewart, elected for one year; Dr. J. D. McQueen, Dr. H. W. Lewis, elected for two years; Dr. J. D. Adamson, Dr. R. J. Martin, elected for three years.

XUM

ALBERTA

The meeting of the Alberta Medical Association held July 2nd, 3rd, and 4th in Edmonton was the most successful meeting in the history of the Association, both from the standpoint of attendance and character of the papers and addresses given. There were 175 registered and a gratifying feature was the large number of physicians from country districts who were present. This year a departure from the old methods was adopted, all the addresses, papers and clinics being given by specialists from outside the province.

From McGill University there came Dr. John Tait, Professor of Physiology, who gave two admirable addresses on "The Skin, its functions and some of its derangements" and "Haemorrhage."

Toronto University was represented by Dr. F. W. Marlow, Associate Professor of Gynaecology, who gave two very valuable and instructive addresses on "Symptomatology and Diagnosis of Pelvic Conditions" and "Management and Treatment of Pelvic Diseases."

Dr. George S. Young, Associate in Medicine, Toronto University, addressed the Canadian Clubs on "Canada and the Medical Profession" and gave a clinic at the Royal Alexandra Hospital on "Physical examination of the patient," both of which contained matter of much value to our members. He also gave a most interesting and instructive paper on "Psychotherapy."

Dr. F. N. G. Starr, Associate Professor of Surgery, Toronto University, gave two addresses on "The Right Iliac Fossa" and "Gall Bladder Disease." These very important topics were treated in a thorough but conservative manner and many practical points in their management were elucidated.

From ancient Queens', there came a gentleman who for the versatility of knowledge and exquisite humour he introduced into his addresses, will long be remembered by those who had the good fortune to hear him. This was Dr. J. L. Austin, Professor of Surgery, Queens' University. He gave addresses on "The Indications for Operations in Head Injuries and the After Results of Skull Operations," "Diseases of the Rectum," and "Surgical Conditions of the Fingers and Hand." He also addressed the Board of Trade and the Association on the "History and Nature of Syphilis."

At the banquet Thursday evening the chief speaker was Dr. T. C. Routley, who spoke very convincingly and effectively on the benefits to be derived by the profession, individually and collectively, from an increased membership in the Canadian Medical Association. It was clearly shown that by organization of the Medical profession of the Dominion and the perfect co-operation of the Provincial Association with the Canadian Medical Association, iniquitous legislation which from time to time threatens the welfare not only of our profession but the health and safety of the public generally, can be successfully combated and prevented from gaining a foot-hold. With proper support by the indivual members of the profession, the Canadian Medical Association can properly and effectively conduct through the press a program of education of the public, in reference to public health problems and the aims of the medical profession.

Perhaps the most important and valuable address given, was that by Sir John Thomson-Walker, O.B.E., Senior Urologist, King's College Hospital, London, on "Infections of the Urinary Tract." The Association is to be congratulated on being able to secure so eminent an authority on the subject.

Dr. Stewart of Ninette Sanitorium and Dr. R. E. Wodehouse, Secretary of the Canadian Tuberculosis Association, also contributed to the programme on the subject of tuberculosis in their usual effective manner.

The programme as arranged was the result of an endeavour of the four western provinces to co-operate in the arrangements for their provincial meetings, with the Canadian Medical Association. The arrangements were made through the assistance of Dr. T. C. Routley, Secretary of the Canadian Medical Association, who was largely responsible for the securing of the speakers.

During the convention a resolution was passed requesting the Medical Council to make a grant of $450 towards the Lister Memorial Fund. This request the council, which was in session at once complied with, and as a result every registered physician in Alberta has become a contributor to this worthy cause.

At the business meeting held at the close of the convention the President, Dr. E. W. Allin and his executive were warmly congratulated on the successful results achieved in holding the convention under the new method adopted this year, and a recommendation was passed that the new executive should follow the same system.

The officers elected for the next year were:—Honorary President, R. D. Sanson, Calgary; President, W. Hackney, Calgary; First Vice-President, I. R. Bell, Edmonton; Second Vice-President, W. H. MacDonald, Medicine Hat; Secretary, W. Merritt, Calgary; Treasurer, J. E. Palmer, Calgary.

Executive Committee.—R. E. Buswell, High River; T. R. Ross, Drumheller; R. D. Robertson, Wetaskiwin; R. P. Borden, Daysland; J. T. Clarke, Didsbury; A. E. Aikenhead, Calgary; W. O. York, Provost; E. W. Allin, Edmonton; W. S. Galbraith, Lethbridge; W. A. Wilson, Edmonton.

The following were elected to the Executive of the Canadian Medical Association for the year 1925:—W. H. MacDonald, Medicine Hat; P. M. Campbell, Lethbridge; R. Parsons, Red Deer; G. R. Johnston, Calgary; E. W. Allin, Edmonton; T. H. Whitelaw, Edmonton (alternate).

The following were appointed to serve on the Provinsial Editorial Board for the *Canadian Medical Journal*: P. M. Campbell, Lethbridge; C. E. Smythe, Medicine Hat; George E. Learmouth, Calgary; H. Burton Logie, Edmonton; T. H. Whitelaw, Edmonton.

BRITISH COLUMBIA

PACIFIC NORTHWEST MEDICAL ASSOCIATION CONVENTION AT VANCOUVER, B.C.

JUNE 26th, 27th and 28th, 1924

The Third Annual Meeting of the Pacific Northwest Medical Association, held in Vancouver on June 26th, 27th, and 28th, furnished ample proof that this Association, while one of the youngest associations on the continent, is a lusty youngster, destined to measure strength and usefulness with any of its older confrères in the country in the near future.

The attendance was much the largest since the inception of the Association. There was a total registration of 589. Being the first international medical convention ever held in B.C., it attracted perhaps more than usual attention from all members of the profession in the province, but their faithful attendance at all sessions indicated that it was a keen desire to take

active part in the work of the convention, rather than any sense of duty as hosts, that was the underlying motive. The attendance at all sessions was quite remarkable, and a full house when the morning meetings opened sharp at 8.30 made some of the easterners rub their eyes. They found that it was a gathering of earnest men, eager to take full benefit of the opportunities it afforded in the practical talks of recognized authorities. The social side of the meeting, however, did not suffer in any way from this devoted attention to business. The great majority of the delegates had brought their wives; many of them had their whole families with them, and it was estimated that in all there were more than one thousand visitors connected with the convention in Vancouver during the three days.

There was but one official function of a social nature, the noon-day luncheon held on Friday at the Ambassador Café, when upwards of 400 delegates sat down to an excellent meal, with music, and heard the presidential address of Dr. Homer Dudley, the retiring president, Dr. T. C. Routley, of Toronto, General Secretary of the Canadian Medical Association presided, and short addresses were also given by Sir John William Thomson-Walker, of London, England, the eminent urologist, and Dr. Walter W. Chipman of McGill University. The former gave a much appreciated talk on international relations, particularly as they affect the profession. Delegates and their wives and families were given ample opportunity to see and enjoy the beauty spots in and around Vancouver which have made this city one of the famous tourist centres of America. Scores of Vancouver doctors opened their homes to the visitors and family parties of this nature were among the most enjoyed incidents of the whole convention. A large and energetic committee of doctors' wives took charge of the women and children from the time of their arrival and there was a constant succession of motor drives, teas, golf at the country clubs, yachting and launch trips, etc. The presence of three of the principal ships of the British Special Service Squadron on its cruise around the world, proved one of the big attractions. Almost everyone attending the convention found their way on board *H.M.S. Hood*, the great battle-cruiser, which is not only the pride of the British Navy, but the largest and most powerful war vessel afloat. Here they enjoyed the hospitality of the Vice-Admiral and officers of the squadron. All six sessions of the convention were held in the ballroom of the Hotel Vancouver, where the delegates had practically the run of the house, and the majority of them had their rooms. The hotel made an ideal headquarters for such a gathering. Large spaces were set aside for the convention offices and for the exhibits of firms specializing in instruments and appliances. For three days the medical men wearing their identification badges, and their wives and children filled the lounges, the corridors, the drawing rooms and the dining rooms and were made to feel as much at home as if they owned the place. Here they met tourists and travellers from all corners of the world, as ships from the Orient arrived during their stay and others about to sail brought their quota of passengers from distant cities.

Delegates were in attendance from all of the States and Provinces represented in the Association, including Washington, Oregon, Idaho, Utah, Montana, and British Columbia, Alberta and Saskatchewan. Among the guests were the following:—

DR. FREDERICK J. COTTON, A.M., M.D., F.A.C.S., Visitign Surgeon Boston City Hospital, Consulting Surgeon New England Hospital for Women and Children.

DR. HORST OERTEL, M.D., Strathcona Professor of Pathology, McGill University.

DR. L. G. ROWNTREE, M.D., D.Sc., Professor of Medicine, Mayo Foundation for Medical Research.

DR. CHAS. HUNTER, M.A., M.D., Associate Professor of Medicine, University of Manitoba.

DR. FREDERICK N. G. STARR, C.B., M.D., C.M., F.A.C.S., Associate Professor of Clinical Surgery, University of Toronto.

DR. LORIMER J. AUSTIN, M.A., F.R.C.S. (Eng.), F.A.C.S., Professor of Clinical Surgery, Queen's University; Chief of Surgical Service, Kingston General Hospital.

DR. JOHN TAIT, Professor of Physiology, McGill University.

DR. GEORGE SILLS YOUNG, Associate of Medicine, Toronto University.

DR. T. C. ROUTLEY, General Secretary, Canadian Medical Association.

At the business meeting Dr. E. M. Larson, of Great Falls, Montana, was chosen President for 1925; Dr. Jas. L. S. Stewart, of Boise, Idaho, as first Vice-President; Dr. Frederick Epplen of Spokane, Washington, was unanimously re-elected to the pasition of Secretary-Treasurer.

Dr. Alexander S. Monro, president-elect of the convention of 1923 at Seattle, assumed the Presidency, and to his unremitting personal work as chairman of the General Committee of Arrangements, much of the success of the convention was undoubtedly due. Dr. Monro, who is one of the leading surgeons of Vancouver is a "one hundred per cent. Canadian," but he made American delegates feel that for him and his associates in the profession in British Columbia, the international boundary is a pure myth.

PROGRAMME

Thursday, June 26th.

Dr. Charles Hunter: "Two Common Types of Headache."
Dr. Frederick J. Cotton: "Standardization of Fracture Treatment." "Handling of Hip Fractures and Results."
Dr. Joseph Brennemann: "Throat Infections in Children."
Dr. S. A. Kinniar Wilson: "Some Common Neurological Symptoms."
Recess.
Sir John Thomson-Walker: "The Relation of Calcified Abdominal Glands to Urinary Surgery."
Dr. Horst Oertel: "The Flow of Structure with age and disease." Lantern Slides.
Dr. L. G. Rowntree: "Cardio-renal Vascular Diseases."
Recess.
Dr. John Tait: "Hemorrhage." (Illustrated by Moving Pictures).
Dr. F. N. G. Starr: "The Right Iliac Fossa."

Friday, June 27th.

Dr. John Tait: "The Skin, Its Functions, and Some of Its Derangements." Lantern Slides.
Dr. L. J. Austin: "The Pathology, Diagnosis and Treatment of Gall Bladder Disease."
Dr. L. G. Rowntree: "Liver Function Studies."
Dr. W. W. Chipman: "The Puerperal Uterus and Its Infection."
Recess.
Dr. S. A. Kinniar Wilson: "Involuntary Movements and Their Significance."
Dr. Geo. S. Young: "Physical Examination of the Patient."
Dr. L. J. Austin: "The indications for Operation in Head Injuries and after Results of Skull Operations."
Recess.
Dr. T. C. Routley, General Secretary C.M.A., will

address Members of B. C. Medical Association.
Prof. S. Lyle Cummins: "Tuberculosis."
Dr. W. W. Chipman: "Ectopic Gestation."

Saturday, June 28th.

Dr. Geo. S. Young: "Goitre and Its Medical Treatment."
Dr. W. W. Chipman: "Adolescent Dysmenorrhoea."
Dr. S. A. Kinniar Wilson: "A Neurological Clinic."
Dr. F. J. Cotton: "Osteomyelitis." "Brodie's Abscess and the Chronic Infections of Bone."
Recess.
Dr. Charles Hunter: 'Psychotherapy from the Standpoint of the General Practitioner."
Dr. L. J. Austin: "Surgery of the Hand."
Dr. L. G. Rowntree: "Diseases of the Pituitary and Adrenal."
Dr. Horst Oertel: "The Relation of the Pancreas to Diabetes."

ENTERTAINMENT

It was hoped that arrangements might be made for a trip to Alaska, the Land of the Midnight Sun, for those who wished to see this land of wonders. Unfortunately, it has been found impossible to book passage on any steamer travelling north, as all accommodation was exhausted early in January of this year.

Vancouver, however, presents many points of interest, and members bringing their wives will find much to please and occupy them. The city has five excellent golf links, and arrangements can be made for games. Sight-seeing trips by motor and by boat can be taken daily. The beaches of the city are unexcelled and are well equipped for children. Stanley Park alone is worth a visit to the city. Excellent roads provide good motoring, and as a special attraction this year there is the visit of the British Squadron, including the greatest battleship ever built—*H.M.S. Hood*—to which trips for sightseers and visitors will be arranged.

The Annual Meeting of the B. C. Medical Association was held in Vancouver on June 25th. There was a representative gathering of medical men from all parts of the province. The following officers were elected for the ensuing year:—Dr. C. H. Vrooman, Vancouver, President; Dr. W. B. Burnett, Vancouver, Vice-President; Dr. H. H. Murphy, Kamloops, President-Elect; Dr. J. H. MacDermot, Vancouver, Secretary-Treasurer.

At the Association luncheon, at which there was an attendance of about 120, a very interesting address was given by Dr. Frederick J. Cotton of Boston, on "Industrial Surgery including Reconstruction Methods." At the evening session a capacity audience listened to a very able address from Dr. S. A. Kinniar Wilson, the eminent London neurologist.

The Biennial Meeting of the Pacific Northwest Pediatric Association was held in the Hotel Vancouver on the 26th of June. There was a very large and enthusiastic attendance.

Dr. Joseph Brennemann of Chicago, and Dr. Bilderback of Portland, Oregon, were among the speakers. The next meeting of the Pacific Northwest Pediatric Association will be held at Portland, Oregon.

Dr. E. B. Struthers, of the University Hospital, Tsinan, Shantung, China, very kindly volunteered to address the Vancouver Medical Asociation on the recent advances in the treatment of Kala-Azar. A special meeting of the Association was held in the University of British Columbia to hear Dr. Struthers' lecture. Dr. Struthers showed slides of the Leishman-Donovan bodies, and illustrated his remarks with numerous maps, photographs and diagrams. His address was much appreciated. Dr. Struthers with his wife and children passed through Vancouver on his way from the Orient to his home in Toronto for a holiday.

Dr. E. Murray Blair, who was formerly associated with the American College of Surgeons in hospital inspection work, but who is now specializing in obstetrics in Vancouver, was married on June 9th, at Chalmers Presbyterian Church, Vancouver, to Miss Velma Grice, of Thornhill, Ontario.

We deeply regret to record the sudden death while on a holiday, of Dr. Francis T. Ewing, a member of the Vancouver Medical Association. Dr. Ewing was a graduate of Toronto University and specialized in quartz light therapy in Vancouver.

Dr. G. A. Lamont who recently obtained a travelling scholarship in pediatrics through the United States Public Health Department, has left Vancouver for San Francisco, Los Angeles, Chicago, New York and other points and expects to be absent for about three months.

A Case of Poisoning Due to Camphor Liniment.—One hour and fifteen minutes after swallowing an ounce of camphor liniment mistakenly administered for castor oil by an attendant, a patient of Milton C. Lang, Baltimore, was found in a convulsion of epileptiform character, which lasted six minutes. He then recovered consciousness, and complained of weakness, inability to stand up, nausea, nervousness, severe headache and pain in the eyes. His condition rapidly grew worse, and he became semi-delirious. Although no definite convulsions were noted, there were frequent twitching movements of the lower extremities. The patient was restless, his skin was pale and clammy, the pulse regular but rapid; the blood pressure was 120 systolic, and 75 diastolic. The respirations were loud, rapid and shallow, but were frequently interrupted by deep gasps. Therapy consisted of gastric lavage. In the morning the patient was much better, complaining only of slight nausea.—*Jour. Am. Med. Ass.*, June 28, 1924.

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Book Reviews

Students' Guide to Operative Surgery. By Alfred T. Bazin, D.S.O., M.D., Assistant Professor of Surgery and Clinical Surgery, McGill University; assisted by F. A. C. Scrimger, V.C., B.A., M.D.; F. J. Tees, M.C., B.A., M.D.; L. H. McKim, M.D.; H. McL. Thompson, B.Sc., M.B., Ch.B. (Edin.) of the Department of Surgery and Anatomy, McGill University. Renouf Publishing Company, Montreal.

This compendium is designed as a guide for undergraduate students to the course in operative surgery on the cadaver. It is written concisely; nevertheless it includes a great deal of clinical as well as anatomical information, very briefly yet sufficiently set down, concerning the injuries and diseases for which the respective operations are ordinarily performed. The reviewer knows of no more practical or more useful book of its size upon the subject. While there are no illustrations, of which, by the way, modern books contain too many (excessive illustration, after all, is an insult to one's intelligence), the descriptions of the various operations are so clear that pictures seem unnecessary.

Insome respects the scope of the book is unusually wide. The ligation of arteries, and the ordinary amputations, together with intestinal suture, hernia, appendicitis, rib resection, tracheotomy, and tendon suture, are, of course, well given; but in addition one finds certain modern operations, which have become part of the emergency surgery of the general practitioner, well described; as for instance, subtemporal decompression, drainage of the knee-joint, nerve suture, and lumbar puncture. There is a useful appendix prepared by Professor J. C. Simpson upon the organization of the class, which will probably be welcome to other teachers of such courses. Altogether the book is heartily to be recommended, and we must congratulate Professor Bazin and his able assistants upon an excellent piece of work, and one which will be particularly valuable to McGill students.

Transactions of the American Surgical Association—Volume the forty-first, containing the papers read before the Association at the meeting held May 31 and June 1 and 2, 1923, at Rochester, Minn. Edited by John H. Jepson, M.D., Recorder of the Association. For sale by William J. Dornan, Philadelphia.

This volume contains thirty-eight articles by the leading surgeons of America on almost as many conditions of present day interest.

The Presidential address by Lewis L. McArthur, M.D., of Chicago, deals with "Common Bile Duct Repair," and makes a strong plea for the method of insertion of a small rubber tube or catheter into the proximal end, across the bridge, through the distal end, and well into the duodenum.

Of outstanding interest are the articles on "Many-stage Operations for Goitre" by Martin D. Tinker, M.D., "An analysis of 755 Cases of Neuralgia of the Face, Before and after Operation," by Chas. H. Frazier, M.D., "Splenectomy in Hemorrhagic Purpura" by Jas. M. Hitzret, M.D., "The Operation of Choice in the Surgery of the Kidney" by William E. Lower, M.D., "The Use of Free Transplants of Fascia as Living Sutures in the Treatment of Hernia" by W. E. Galle, M.D., and A. B. Lemesurier, M.D., a method now well known to most Canadian surgeons, and "The Prognosis and Treatment of Fractures of the Leg and Ankle" by Astley P. C. Ashhurst, M.D.

The entire volume, like its predecessors, is of extreme value, as containing all that is best, and at the same time most recent, in American surgery, which value is distinctly enhanced by the appended discussions on the various contributions. E. R. S.

The Circulatory Disturbances of the Extremities, including gangrene, vasomotor and trophic disorders. By Leo Buerger, M.A., M.D.. New York. Pp.xiii + 628, seven by nine inches with 188 illustrations. Price $9.50. Philadelphia and London, W. B. Saunders Company, 1924. Canadian Agents J. F. Hartz Company Limited.

This volume dedicated to W. J. Mayo and Emanuel Libman is a comprehensive monograph dealing with conditions falling under the title heading. It is based upon eighteen years' study. Physiological, anatomical and pathological investigation, added to careful clinical observation have enabled the author to clarify somewhat the maze of facts and theory bearing upon such conditions as thrombo-angiitis obliterans, Raynaud's disease and erythromelalgia. It is difficult to give in a limited space any clear picture of the wealth of material included in this book. There are 108 chapters. The first 200 pages are principally devoted to anatomical, physiological and pathological considerations, including microscopy, nervous control, vasomotor disturbances, and the capillary circulation, with thrombus formation and gangrene. In the clinical studies leading up to differential diagnosis and treatment, arteriosclerosis receives much attention, and the various forms of arteritis are fully discussed. The author has illustrated this portion of the work quite lavishly with microphotographic reproductions. Embolism, spasm, local shock, the acroparasthesiae, scleroderma, vasomotor instability, and neurotrophic disorders in spina bifida are some of the chapter headings. The references to the literature are found at the foot of each page and there is a bibliographic index. The author is to be congratulated upon the successful and masterful treatment of his subject and upon the production of a book which will long form a standard reference hand book, almost encyclopedic in its thoroughness, of a group of diseases which he has done much to clarify. J. H. E.

Proceedings of the Royal Society of Medicine. Longmans, Green and Company, London.

We have received Vol. xvii No. 7 for May, 1924. It contains papers, reports and discussions of the sections of anaesthetics, balneology and climatology, history of medicine, laryngology, medicine, odontology, ophthalmology, orthopaedics, otology, tropical diseases and parasitology, and urology. The one contribution from the general session is a special discussion on the grading of the population from the point of view of physical fitness.

Col. Howell's paper on "The British medical arrangements during the Waterloo campaign" is an excellent one. In medicine, Dr. Gustave Monod makes an interesting contribution on the subject of "Haematemesis without lesions." It would appear that the publication committee select their papers for the transactions and edit the discussions carefully. J. H. E.

Two Lectures on Gastric and Duodenal Ulcer, a record of ten years' experience. By Sir Berkeley Moynihan, Leeds. 8vo. of 48 pages. Price 2s 9d post free. John Wright & Sons Ltd., Bristol, 1923.

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As for piles, no doubt they can be treated by purely local measures such as the adrenostyptic ointment and suppositories, but as direct action is often insufficient, we must also combat the excessive blood pressure and the varicose stasis, of which varicose ano-rectal veins (piles) are only the outward and visible manifestations.

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The first lecture "On some problems of gastric and duodenal ulcer" was delivered before the Hunterian Society of London, January 29th, 1923, and appeared in the *British Medical Journal*, February 10th, 1923. The second on "Duodenal Ulcer" was delivered before the Harveian Society of London, March 22, 1923, and appeared in *The Lancet*, 1923, i, 631. In the ten years under review, the author has operated upon 718 cases. There were 513 cases of duodenal ulcer with no death from operation. There were 164 cases of gastric ulcer alone and 23 cases of gastric and duodenal ulcer. In this series of 18 cases, there were two operative deaths. Sir Berkeley makes out a good case for the operative treatment of ulcer with excellent results and an exceedingly low mortality. He admits the possibility of satisfactory results from medical treatment but points out the practical difficulty of keeping a patient under strict regime for the many months often necessary to secure the necessary result. He feels that the physician has much to learn from the observations made on living pathology in the surgical theatre, for only by such observation can the physician realize how protracted and how scrupulous the medical treatment of so grave a lesion must necessarily be. J. H. E.

Differential Diagnosis. Presented through an analysis of 317 cases. By Richard C. Cabot, M.D. Professor of Medicine and Professor of Social Ethics at Harvard University, Volume II, third edition. 8vo, 709 pages, 254 illustrations. Cloth $9.00 net. Philadelphia and London; W. B. Saunders Company, 1924. Canadian Agents, The J. F. Hartz Co., Limited, Toronto and Montreal.

A little over nine years ago we had the pleasure of reviewing this work on its publication. It was reprinted three times, and revised in 1917 with three subsequent reprintings. A volume with such a record requires no introduction to the medical profession. Those who are acquainted with the work will find little change in the new edition other than in the chapters on abdominal and other tumors where the introductory discussion has been rewritten and extended. There is no change in the case reports, and the additions have been made without altering the number of pages in the book. It should continue as a standard of its type on diagnosis. J. H. E.

Diseases of Middle Life. The prevention, recognition and treatment of the morbid processes of special significance in this critical life period, comprising twenty-two original articles by various eminent authorities. Edited by Frank A. Craig, M.D., Associate Director of the Clinical and Sociological Department of the Henry Phipps Institute of the University of Pennsylvania. In two volumes, 8vo., pp. xi + 951, viii + 920. Illustrated Price $15.00 net. Philadelphia: The F. A. Davis Company, publishers, 1923.

With special works on the diseases of childhood, and on the diseases of old age, Craig has filled the gap with these volumes on middle age. In addition to treating of disease, the general subjects of diet, exercise and occupation have been made essential features in an attempt to present a study of all the features which may influence the later years of the individual. The editor has endeavoured to assist the physician in directing, advising and treating those individuals in whom the examination has revealed the presence of signs or symptoms suggesting the beginning of a pathological process. He believes that careful observation may detect in middle life many of the symptoms of the diseases of old age, and methods may be formulated for the prolongation of life or for rendering old age an efficient and enjoyable period of existence. Twenty-two authors are responsible for the various sections into which the work is divided, each an outstanding physician in the department to which he contributes.

Though one finds the various articles not of apparent equal merit, the editor is to be congratulated on presenting a work which so nearly meets the ideal he hoped to reach, as expressed in his preface. We could wish that the section on dermatology was less scant in regard to diagnosis, and paid more attention to the treatment, which is almost neglected. Nor do we think it wise that in a work for the general practitioner, so much space in the section on the heart should be devoted to electrocardiograms and their interpretation. We think this is a special subject which like many other diagnostic procedures, not being available for the man in general practice, might well receive less space. The index, too, is faulty. Though syphilis and tuberculosis receive due attention in the text of the second volume, neither word appears in the index, and we can find no reference in text or index to extragenital chancre. Some of the sections are exceedingly well written and the whole work well balanced for one contributed to by so many authors. J. H. E.

The Treatment of the Common Disorders of Digestion. A handbook for physicians and students. By John L. Kantor, Ph.D., M.D., Chief in Gastro-intestinal Diseases, Vanderbilt Clinic, Columbia University. 245 pages, 6 x 9, with sixty-four illustrations. Price, cloth $4.75. St. Louis, the C. V. Mosby Company, 1924.

This volume has been written as a handbook of treatment. It deals with the digestive disturbances which the general practitioner is most likely to meet. It aims to be practical. The various procedures to be undertaken are well described and the principles underlying therapy are made clear. Functional disorders, ptosis, and the effects of asthenia are considered as well as the organic diseases such as ulcer, constipation, gall bladder disease and the diarrhoeas. A special chapter is devoted to headaches of gastrointestinal origin. The illustrations add much to the text. The radiograms used are well reproduced as are the drawings of apparatus. The diet lists in the various chapters are drawn principally from those used at the Vanderbilt Clinic. Jaundice and cancer are not included. J. H. E.

The Operating Room, Instructions for Nurses and Asisstants. By the Staff of St. Mary's Hospital, Rochester, Minnesota (The Mayo Clinic). 12mo of 165 pages with 144 illustrations. Cloth $1.75 net. Philadelphia and London; W. B. Saunders Company, 1924. Canadian Agents, The J. F. Hartz Co., Toronto and Montreal.

This small volume gives in some detail the preparations for various operations, as regards the patient, the operating room, and the instruments required as carried out at the Mayo Clinic. The various operations commonly done are well covered, with a complete list of the various instruments required for each, which are named, and subsequently illustrated in a separate index. A certain amount of repetition is unavoidable, but the book is remarkably free from padding.

It should prove of value to those in charge of operating rooms where certain of the operations are not frequently performed, though it must be borne in mind that different surgeons will sometimes prefer different instruments to accomplish the same result. E. R. S.

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XUM

Cosmetic Surgery. The Correction of Featural Imperfections. By Charles Conrad Miller, M.D., Chicago. Small 8vo, 263 pages with 140 illustrations. F. A. Davis Company, Philadelphia, 1924.

This volume is essentially an outline of the author's methods in what may be termed "beauty surgery," the correction of folds, bags and wrinkles about the eyes, face lifting operations, correction of double chin and so forth. While partaking of many of the characteristics of plastic surgery, the field involved is so specialized that many of the methods described would find little application in other parts of the body.

The numerous illustrations add materially to a proper understanding of the text, but one gains the impression that considerable actual experience in this class of work would be essential to the best results, and one feels that in some instances at least, such as in subcutaneous sectioning of face and neck structures for eradicating lines and wrinkles, the author's descriptions are rather vague and indefinite.

The writer apparently recognizes quite well that only a certain percentage of surgeons will wish to take advantage of the demand for cosmetic operations, and he offers the volume "To those who may be interested." E. R. S.

The Surgical Clinics of North America (Mayo Clinic Number, April, 1924). The surgical Clinics of North America, (Issued serially, one number every other month). Vol. IV, Number II, (Mayo Clinic Number, April, 1924) 295 pages, with 88 illustrations. Per Clinic Year (Feb., 1924, to Dec., 1924) Paper, $12.00, Cloth, $16.00 net. W. B. Saunders Company, Philadelphia and London, Canadian Agents, The J. F. Hartz Co., Toronto.

This volume comprises twenty-nine articles of surgical interest contributed by various members of the Mayo Clinic. Of these articles eight refer to various aspects of gastro-intestinal surgery, of which perhaps the more instructive are "Various types of gastric resection," by Donald C. Balfour, and "Carcinoma of the Rectum, recto-sigmoid and sigmoid," by Louis A. Bule. This latter article points out the increase in operability following improved surgical technique, and lays stress on the increased number of two-stage operations.

Four articles concern the surgery of the genito urinary tract, of which that on "Hypertrophy of the prostate," by E. Starr Judd is of great interest.

The remainder of the volume is devoted to a consideration of various subjects, including a most valuable contribution by John de J. Pemberton on "Obstructive Dyspnea following surgery of the Thyroid, and its prevention." Waltman Walters' article on "The surgical treatment of Infectious Arthritis" in which he points out the beneficial results of high amputation of the cervix, or vaginal hysterectomy in certain of these cases is most timely.

The entire volume is a distinct credit both to the authors, and to the publishers. E. R. S.

The Surgical Clinics of North America, Vol. IV, Number I, Philadelphia Number. February, 1924. 302 pages with 90 illustrations.

This volume comprises twenty-five articles from the various surgical clinics of Philadelphia. Of these the first thirteen covering 126 pages are from the Bronchoscopic Clinic of the Jefferson Hospital, and range in their scope from "Pyloroscopy" by Chevalier Jackson, to "Gastrostomy, An Improved Technic," by Dr. Thos. A. Shallow. The work of this clinic is too well known to require extended comment; suffice to say that the articles are all of extreme interest.

The remainder of the volume is occupied by contributions on a variety of subjects from several of the prominent Philadelphia clinics, including "Essentials of Surgical Diagnosis," by John B. Deaver, "Complicated Fractures of the Surgical neck of the Humerus," by E. L. Eliason and D. Hinton, and a very interesting contribution on "Reactions in Transfusions," by I. S. Ravdin.

The high standard set by preceding volumes is well maintained. E. R. S.

Books Received

The Leucocyte in Health and Disease—By. C. J. Bond, C.M.G., F.R.C.S. Size Roy. 8vo. 84 pages with 48 illustrations on 24 plates. Price 12s 6d net. Published by H. K. Lewis and Company, Limited, London, Eng.

First Steps in Organizing a Hospital—By J. J. Weber. Price $3.25. Published by the McMillan Publishing Company, 1924.

Modern Methods in the Diagnosis and Treatment of Heart Disease—By Francis Heatherby. Illustrated. Published by McClelland & Stewart, Toronto, 1924.

The International Clinics—Volume II, 34th series 1924. Illustrated. Price $2.50. Published by J. B. Lippincott Co., 201 Unity Bldg., Montreal.

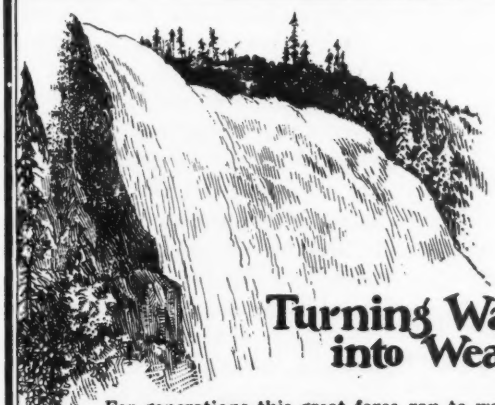
History of the Great War—Medical Services, General History, Vol. 4—by Major General Sir W. G. Macpherson, K.C.M.G., C.B., LL.D. and Major T. J. Mitchell. Price 25s. Published by His Majesty's Stationery Office, 1924.

A Diabetic Manual for the Mutual Use of Doctor and Patient—By Elliott P. Joslin. Illustrated. Price $2 00. Published by Lea, Febiger, Company, Philadelphia, 1924.

The Diagnosis of Nervous Diseases—By Sir James Purves-Stewart, K.C., M.G., G.B., M.D., F.R.C.P. Sixth edition, revised. 648 pages, illustrated. Price 30 shillings net. Published by Messrs. Edward Arnold & Co., London, Eng.

Operative Surgery—Volume IV. Covering the operative technique involved in the operations of general and special practice—By Warren Stone Bickham. Containing 842 pages with 772 illustrations. Cloth $10.00. Published by W. B. Saunders Company, Philadelphia; J. F. Hartz Co., Canadian Agents.

Diseases of the Nose, Throat and Ear—Edited by A. Logan Turner, M.D., F.R.C.S. 413 pages with 222 illustrations and 12 plates, eight of which are in colour. Price $2.50. Published by the MacMillan Company of Canada, Toronto, 1924.



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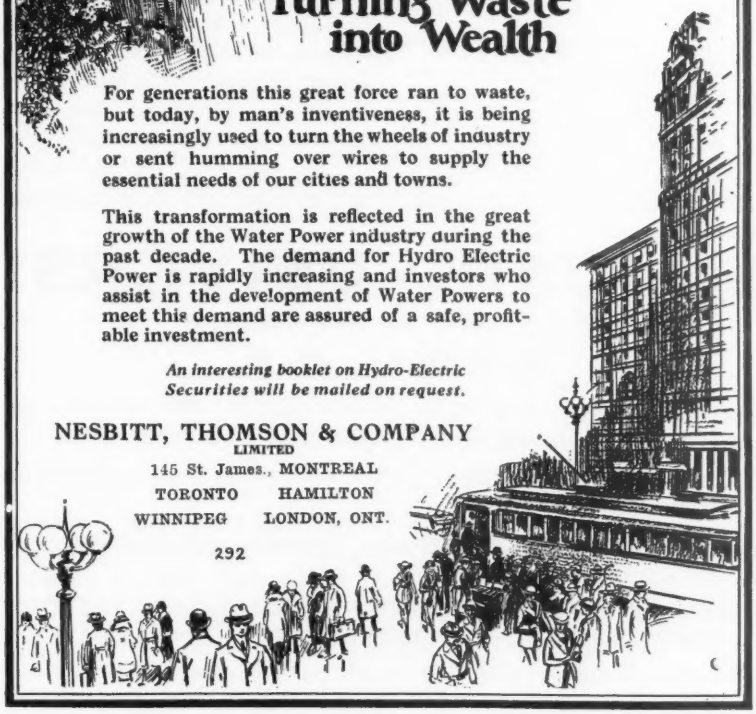

Dislocations and Joint Fractures—Second edition, reset By Frederick J. Cotton, M.D. 745 pages with 1,393 illustrations. Price $10.00 net. Published by W. B. Saunders Company, 1924. The J. F. Hartz Company, Limited, Toronto, Canadian Agents.

The Anatomy of the Nervous System—By Stephen Walter Ranson, M.D., Ph.D. Second edition, 421 pages with 284 illustrations, some in colours. Price $6.50 net. Published by W. B. Saunders Company, Philadelphia. J. F. Hartz Company, Limited, Toronto, Canadian Agents.

Women in Medicine.—The London letter of the *Journal American Medical Association* states that the results of the May examination of London University are remarkable evidence of the diligence and success of women students. For the M.B., B.S. examination, which ranks first among the medical degrees of this country, there were thirty-four women out of seventy-nine in the pass list, and three out of ten in the honours list, and a woman carried off the gold medal. The first woman member has been elected to the council of the British Medical Association. She is Dr. Christine Murrell, one of the many medical women trained at the London School of Medicine for Women who have won distinction.

A New and Early Sign of Ruptured Bladder.—Roger T. Vaughan and Dorrin F. Rudnick, Chicago, inject air into the urinary bladder which allows a positive early diagnosis of vesical rupture by the roentgen ray, and therefore should diminish mortality substantially. The method differentiates between intraperitoneal and extraperitoneal rupture, allowing the surgeon to avoid opening the peritoneal cavity in extraperitoneal ruptures, in which it is best for the peritoneum to remain intact. Thus far the authors have no reason to believe that this procedure carries any added risk to the patient either from air embolism or from infcetion, if used with ordinary asepsis and clinical judgment. It adds no discomfort to the patient. Four cases are reported.—*Jour. Am. Med. Ass.*, July 5, 1924.

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